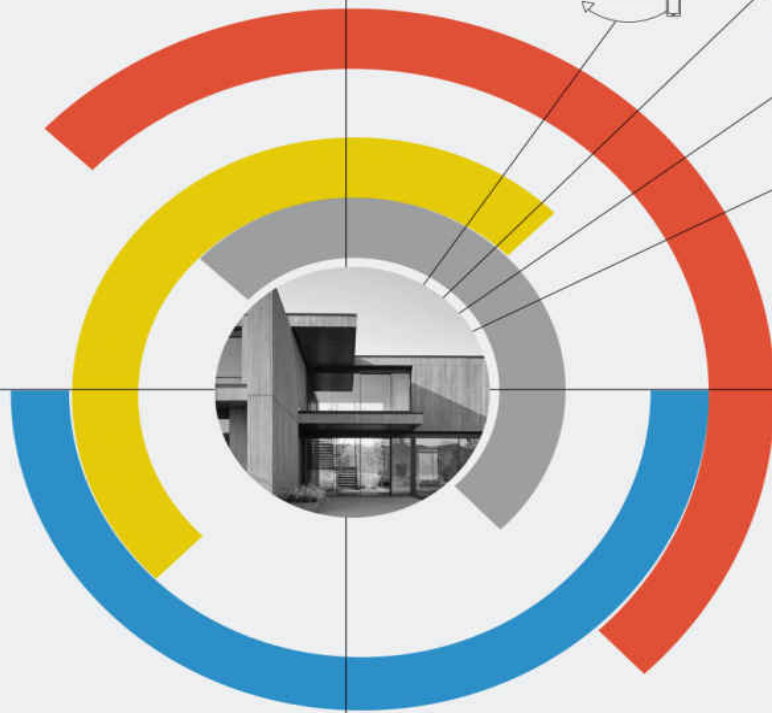


#PropTech

A guide to how property technology is changing how we live, work and invest.



Richard W J Brown

The Property Voice

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and invest.

ACKNOWLEDGEMENTS

This book follows The Property Voice Podcast PropTech series. After 26 episodes, almost 100,000 downloads by lovely listeners and 17 very special guests, spanning industry influencers, academics, journalists, company founders and all-round know-their-PropTech-stuff experts here we are at the end of the journey... with the book credits.

I would very much like to acknowledge and sincerely thank quite a few people that have made this project what it is, I am so grateful for the insights, wisdom, experiences and time that you have all shared...this book would not be possible without a little help from our friends...their brain-power on the subject far exceeds my own, so please feel free to make contact, say thank you and generally tap them up for all matters PropTech why don't you?

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Finally, to my wife Catia, who always supports me with my writing and podcasting, often sacrificing some of our evenings together, so that I can make a last-minute recording or article submission deadline...more than once! Love you x

DEDICATION

I would like to dedicate this book to my late Father, William John Brown, or Bill to most people who knew him. My Dad probably gave me the spark to write, as he had it too. His spark to write did not turn into the burning flame of a completed manuscript, partly because life, including me and my siblings arriving, got in the way.

However, his real flame lives on, in me and in others too. Thanks Dad for the 'writing gene' and for providing the inspiration for me, even if you didn't realise it. Thankfully, you saw the first book, if not this one, but I will tell you all about it one day!

R.I.P. Dad, from your number one Son...in chronological order

before the others chime in



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FOREWORD

The property sector is of interest to most people. We live in it, we work in it and we shop in it. It is tangible; you can kick it and see it and it doesn't change very fast. This last point in particular, is important.

Decisions are made on the basis of decades rather than seconds. The sector, from the processes we use to the people we employ, is built on tangibility and steadiness.

Technology on the other hand is often intangible and is constantly evolving at an incredible pace, so it is no wonder that as these two brilliant, yet completely contrasting sectors, come together there are some big questions to be asked.

Other sectors are further ahead on the digital transformation journey, perhaps because of the very fact that they have not been used to thinking about such long timeframes, but we can learn lessons from some of the experiences these sectors have faced. There are a lot of well documented examples of technology changing sectors: a move to digital cameras, renting movies online or a new way of hailing a taxi. In all these examples and more besides, technology has helped improve the end customer experience. It is also worth noting that in every case, the so called 'disruptors' were only able to grow because the incumbents did not grasp the opportunity.

To be able to plan for the future, any business needs to understand what is going on and it can be very difficult to get your head round things in such a large, complex sector where change is inevitable and becoming constant; from how we use buildings to how we do our jobs. This book takes a comprehensive view of what is going on

to help anyone in real estate understand some of the opportunities and challenges that technology presents.

Technology will change real estate and however you react to it, you must understand what is going on.

This book will help you to do just that.

Dan Hughes
CEO, LIQUID REI
(formerly of RICS)

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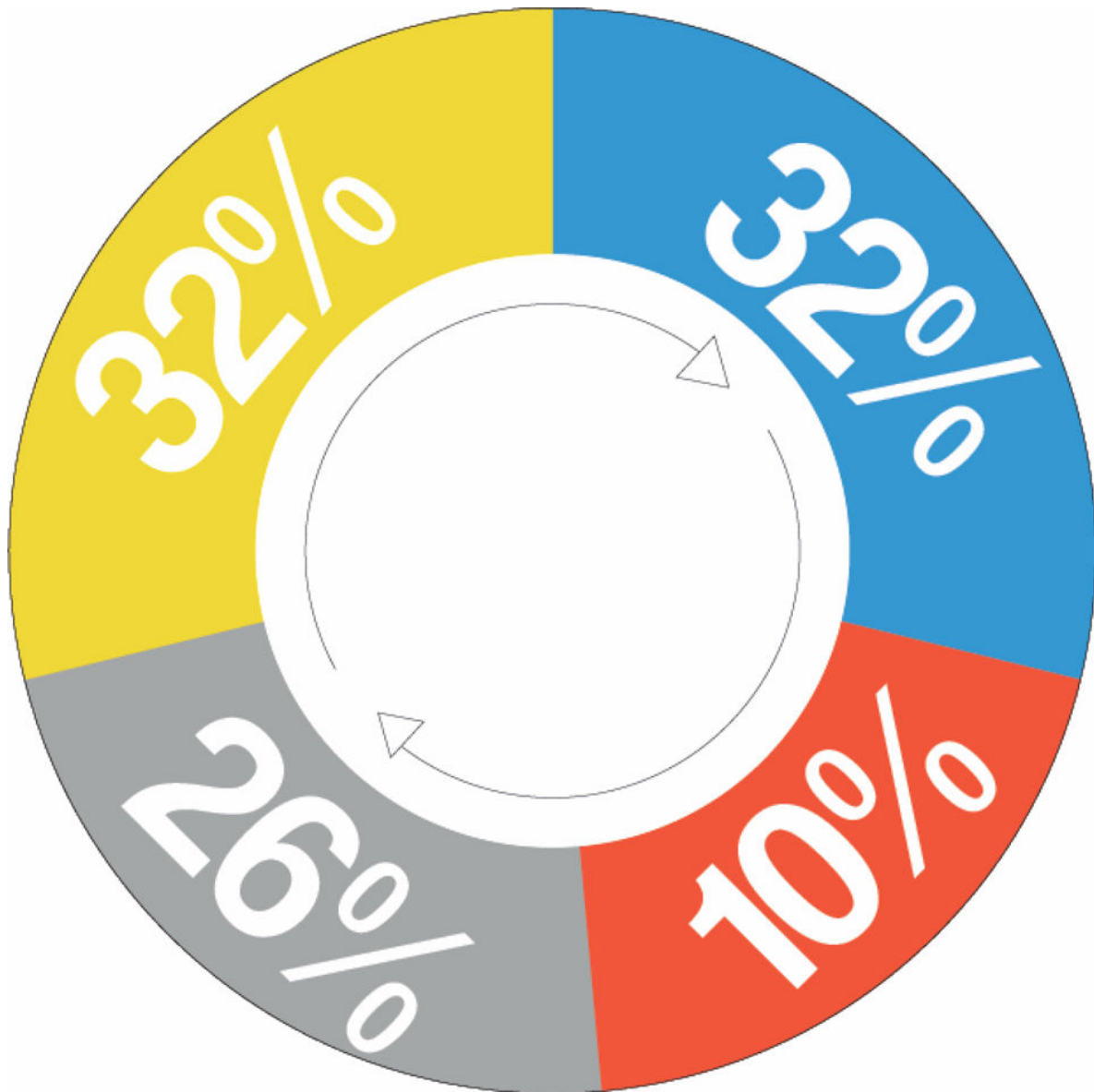
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INTRODUCTION

The world we live in is changing at an astonishing rate. Technology is impacting every area of our lives in ways that would have been unimaginable only a decade or so ago. Some say that property is generally a sector that is slow to adopt new ways of doing things, but there's no doubt that technology is disrupting property now and that is set to continue at a rapidly increasing pace. There are some property technologies that are already with us, or soon will be. We should be cognisant of these, either as threats to the way we do things, or as I prefer to see it, to consider them as opportunities to improve profitability or provide productivity gains instead.

Let's explore how Property Technology or PropTech is affecting UK property investors. This book follows on from my very own PropTech podcast series at The Property Voice Podcast, where I gathered together some great 'subject matter expert' guests, all with fascinating stories to share about how they see PropTech bringing opportunities and challenges to the sector. I'll be giving you links to the best resources I've found both here and also in a separate Book Bonus resource page, which you can find out about later, along with my own insights to help you harness the best of PropTech for your own home and more importantly your investment properties.

**SO, WHAT EXACTLY IS PROP
TECH?**



 **Fin Tech (Financial Technology)**

 **Sharing Economy**

 **Smart Homes**

 **Con Tech (Construction Tech)**

There are four key industry verticals (percentages represent the PI Labs successful funding placements). Source: PropTech 3.0: The Future of Real Estate, University of Oxford Research / Said Business School.

PropTech or property technology is an umbrella term that collects together a whole range of initiatives and sub-topics. Literally speaking, PropTech combines technology advances into the property sector. It takes on elements of other initiatives, such as InfoTech and The Sharing Economy, but these are not exclusive just to PropTech. It has enablers to its success, and as I am discovering through some of my recent conversations, some inhibitors too! PropTech is not exactly new, consider how the Victorians used manufactured bricks as a standardised building material, or how in post-war Britain we managed a housebuilding boom through the use of pre-fabricated structures.

What seems to be different now is the pace of advancement and change, which is generally true of everything we see around us now. Pause for a moment and consider that in 2018, when this book was written, our greatest friend in property, Rightmove, will have its 18th Birthday, the iPhone is only 10 years old, Airbnb is just 9 years old and Purplebricks is still pre-school at 4 years old.

With some assistance from Dan Hughes, who is one of the top PropTech influencers and one of the first guests on the PropTech podcast series, in the last couple of years alone, we have seen:

- 20 million Amazon Alexa devices sold that let people talk to their homes
- Facebook and Google are starting to build houses
- L&G, the insurance company, have set up a factory to assemble what is essentially flat-pack homes
- WeMove is becoming an industry term for flexible work space and arrangements...but now we also have WeLive for a new spin on social community living

This is all under the backdrop that according to IBM we have seen 90% of all the data created in world take place over the last 2 years alone!¹ So, we could also be forgiven for thinking that the rate of advancement is straight line or even exponential too. In fact, I also fell into that trap a little myself. However, as with all things new, there are bumps in the road and obstacles that slow the rate of progress down occasionally. Regulation is one, literally processing the huge volume of data is another, with industry and consumer adoption bringing yet another significant drag on the roll out of the technologies possible.

So, sometimes what we are seeing is possibly evolution rather than revolution...however, both are still progress and that's what I want to highlight throughout this book. What is here right now, what is coming soon and how will this affect and impact us as landlords, property investors or developers.

I have had a number of conversations with people in different sectors and at times it does seem that it is two steps forward and one step back...after all, most progress follows this path rather than taking quantum leaps doesn't it? Even so, there are perhaps also quantum leap exceptions. Just look at anything Elon Musk is doing to see that with electric cars, self-drive, space rockets at 10% of the cost of NASA's and the Hyperloop - to name just a few – there are many radical ideas that are shaking up traditional industries. The same could be said with some technological advances within the property sector, as perhaps we shall see.

It is true that we have seen perhaps greater progress in sectors such as retail, propelled by the Internet and e-commerce, making online shopping an everyday experience for many. However, as Andrew Baum, another top in fluencer and academic in PropTech as well as being another of my esteemed podcast guests highlighted, the number of transactions in property is way lower than it is in retail. This makes the velocity of transaction volumes and stock turnover in property slower too. Planners and council building control

departments stipulate what, how and where we build, financial regulators put straitjackets on the lenders and valuers can literally put a zero valuation on a property if it does not meet certain pre-agreed conventions.

So, we have a way to go yet. But I am optimistic about the future and also with what we already have available right now. For example, whilst on holiday in the USA recently, I signed a loan agreement electronically to support a recent UK property transaction, I managed a booking in a holiday rental in Brazil using an app on my smartphone and conducted a videoconference call with a mentee in Singapore using Skype. These tasks were all completed using advances in technology that were not with us 10-15 years ago, which we can often take for granted.

I read a book recently called *The Second Machine Age* by Andrew McAfee and Erik Brynjolfsson, which discusses information technology as the new industrial revolution. In the book, they shared the story of the second half of the chessboard, which in summary shows how the doubling of quantities placed on each square up to half way on a chess board is nothing compared to the geometric or exponential growth that we will see in the second half.² It has been said that in information technology, we only reached the end of the first half of the chess board in 2013. Another principle, known as Moore's Law, explains how the cost of technology is falling at a dramatic rate, with the cost of transistors halving approximately every 18 months. This implies that the cost of computing power is getting smaller and smaller at the same time that the rate of progress, as per the second half of the chess board illustration, is getting faster and faster. So, we could say that the fastest, most advanced and cost-effective technologies are still ahead of us...and maybe not too far!

So, before I get too hi-tech, let's just consider how PropTech breaks down and perhaps what the big areas of change will be for us.

PropTech consists of three core elements: Information, Transactions & Management/Control. It is the combination and interaction of these three elements that brings property and technology together within Proptech.

There are some key enablers that are pushing this technology drive:

- Hardware & software development – such as PCs, servers & data-centres, along with software application advances,
- Mobile communications and connectivity, such as smartphone applications and smart-connected devices,
- The Internet, including the Mobile Internet, social media & web services such as the property portals.

The convergence of these three enablers is what is fuelling the emergence of the Proptech industry. These are the drivers, but what are the resistors or threats to this progress? Well, as with other sectors, such as retail with the ‘bricks and clicks’ operators, do expect a fight-back from the traditional industry players. Then, there is regulatory catch-up, as the authorities try to keep pace with the rate of technological progress. Just look at how cities such as London, New York and Barcelona have now imposed restrictions on Airbnb-type rentals. There is the human resistance or alternative to factor in – there are still plenty of errors in the results of algorithms and Bots, so plenty of room for human interpretation still. Then, the very real economics of where do cash-accumulating entrepreneurs and companies park their funds? Into long-term assets, such as property is where, which undermines the very essence of what many are trying to bring about i.e. removal of asset-reliance in their business models!

My own knowledge and awareness in Proptech are growing, almost daily. I am very much an interested observer more than a Proptech expert. However, at the time of writing, I see a number of key areas to keep an eye on when it comes to Proptech, these are:

1. ConTech or Construction technology. The ways that PropTech will change our physical environment. In building methods, think of pre-fabricated or modular buildings, alternative and sustainable building materials, 3D printing and robot bricklayers. In design and build, there are emerging trends in Build-to-Rent and in Self-Build Housing. The way we use properties is also changing and morphing between work, rest and leisure. In the UK, we have a chronic housing shortage, at best sluggish productivity gains, and an impending skills gap and skill shift to manage over the next 5-10 years. Technology can play a part in all of these issues to help bridge the gap.

2. Smart Homes & the Internet of Things. Smart homes and home automation are dramatically changing the way that we live. We already have devices and apps that improve energy efficiency, the Internet of Things (IoT) movement allows appliances to be connected to the Internet, and simple, inexpensive hubs and devices are available that allow us to literally speak commands to our homes. Connectivity, convergence and convenience of devices, apps and programming interfaces are at the heart of this emerging trend. Some very big players are making their move into smart home technology and as a result are helping to disrupt the industry, driving down costs as they strive for ward. Megatrends, which we shall cover in some depth, including assisted living with our aging population, increased urbanisation, energy shortages, and the increase in homeworking are just some of the drivers of change here. The result is the use of applications that help us, not only with comfort and lifestyle improvements, but also with cost-savings, increased profitability, differentiation and improved asset management too.

3. Big Data, AI, Systems, Tools and Apps. These are driving efficiencies and cost reduction for property service suppliers, such as conveyancers and surveyors. Desktop appraisal solutions assist investors, lenders and surveyors in valuing properties. Rightmove, Zoopla, upad and Land Registry are all providing data at an increasingly granular level, which allows us to have greater

confidence in our investment and rental decisions. Artificial Intelligence (AI) and Bots are already being used by some Estate Agents to give a better, more personalised service to clients with fewer staff. There are a plethora of systems, apps and tools that can help us to better run our business lives, whether they are specific to property management, like Arthur, or more general business tools, such as Xero for accounting and banking integration with mobile-friendly bank accounts, such as Tide. There are simple tools, such as spreadsheets & calendar apps, task-based apps, such as Doodle & Evernote, communication apps like WhatsApp, and cloud storage services like Dropbox that are no doubt already helping in our property businesses today.

4. Audio-visual Advances including augmented reality/virtual reality (AR / VR) and drones. The use of visualisation techniques is not a new area in property but is becoming far more mainstream now. Improvements in graphical technologies and computer-generated imagery (CGI) make for more cost-effective solutions, such as removing the need for an expensive to build show home; engaging emotion in the purchasing decision of new builds for faster, higher value sales; increased efficiency through the use of remote video viewings; and reduced risk by the use of lifelike 3D development models for planners to grasp better; and safer building maintenance by using drone inspections in hard to reach locations...all part of this more recent trend emergence.

5. The Sharing Economy. A number of new technologies have come together to make Sharing Economy business models possible in a number of different sectors. From peer-to-peer lending, room-only and holiday rentals, one-way furniture removals, to online contracting & staffing, the Sharing Economy continues to be a major disruptor. We shall see how the overlap of the Digital Economy, Sharing Economy and Gig Economy is helping to bring new business models, create changes in how assets are charged for and is taking us into a new world of customer service backed up by trust and social proof. Here, we shall see that value, speed, reduced cost of

delivery, convenience and service are coming together through these new disruptors to shake the tree...who is going to fall out though?

6. FinTech, or Financial Technology. The worlds of finance, payments and lending are changing due to technological advances. Property transactions have taken place in alternative or cryptocurrencies like Bitcoin, specialist P2P and crowd-funding sites are enabling almost anyone to invest in property and alternative funding sources for investors and developers are starting to emerge. Mobile/digital payment technology is revolutionising the way we make transactions domestically and internationally. A bank is no longer a building but an app on your phone, paper is being replaced with digital exchanges and humans are being complemented, or even replaced by machines to shake up this traditional sector.

7. Blockchain & Cryptocurrencies. Consider Blockchain technology, which some would say is the next Internet, that can make a 'smart digital contract' binding without a middle man, all conducted within seconds. This could revolutionise conveyancing, lending, insurance and a range of other property-related services. Add in other technologies, such as AI and the Internet of Things into the mix and there could be some genuine 'killer apps' that come out of this recent breakthrough technology. Beware the status quo though, the banks and governments remain both sceptical and vigilant, so it could make for a bumpy ride.

8. EdTech or Education, Learning and Development. Everyone from RICS through the NLA / RLA to law firms, software providers and specialist property training companies seem to have a training offering these days. If we want to become an accredited landlord, a certificated property developer, or develop more operational skills in areas such as HMOs, rent-to-rent, serviced accommodation or a range of alternative / creative property strategies, there is some sort of online or face-to-face learning offering to suit. Some of the progress here is not strictly PropTech, however, I felt it important to include a specific section on learning and development for a number

of reasons, one of them is that to stay current and not be overtaken, we need to find methods to stay up to date in ways that suit us best.

9. The Big Picture. Or how megatrends, smart cities and globalisation are going to affect us over the coming years. Economic power and wealth are shifting to the east, this means that our tenants, buyers and even lenders might have origins and roots from unfamiliar places. Accelerating urbanisation means more city-living, where space is at a premium making for more micro-, assisted- and community-living. Smart-cities are more interconnected 'hubs' where home-meets-work-meets-play in a more aligned way, and heightened environmental and energy shortage issues mean we need to constantly upgrade our properties to remain both compliant and competitive.

These are the key themes that we will continue to explore in greater detail over the coming chapters as the book unfolds. As I mentioned, I was joined on a recent series of my very own The Property Voice Podcast by a selection of 'subject matter expert' guests. Many are PropTech Founders, some are heavy-weight academics, industry influencers and venture capitalists and others very much into the big picture strategy or in amongst the nuts and bolts of the subject through their daily work or businesses. They all share a keen interest in the topic, along with a willingness to share their wisdom and experience. I am so grateful that these guests gave their time and expertise to help us all to better understand this emerging and sometimes complex topic, which has spilled over into this book as well. There is a list of key contributors in the acknowledgements section for you to refer to and perhaps even reach out to. Stick with me throughout this book, as we merge technology and property, lifting the lid on what is happening right now and also what we can expect down the line too. There is no doubt that PropTech can improve our property businesses in terms of productivity and also profitability. There is also no doubt that if we choose to be an ostrich and bury our head in the sand, that we might also get our backside bitten if we are not too careful! PropTech, is a huge subject area that

is going to change property investment, development and indeed our wider lives in myriad ways. There will certainly be some bumps along the way but, PropTech has the potential to create huge opportunity for tenants, homeowners and investors alike.

Personally, I see the greatest number of new entrants into the sector coming from the FinTech arena...after all that's where the money is! After this, the sharing economy will continue to make waves, potentially having its wings clipped by the regulators along the way. Finally, Smart Homes and ConTech will bring about improvements in how we operate and use property in our daily lives and investments...perhaps slowly and very much dominated by the big global players with deep pockets. One or two game-changing technologies might just breakthrough to make a very big impact; perhaps this could be Blockchain, the Internet of Things or the hard to identify Big Data segment? In amongst all this, are a range of apps and technologies that we can utilise to make our property businesses more profitable and productive. However, as with the Internet revolution, there will be winners and losers, and the first one through the door often gets shot! So, be ready to embrace the change, but expect the changemakers to also change themselves, or at least be acquired by the big boys...probably.

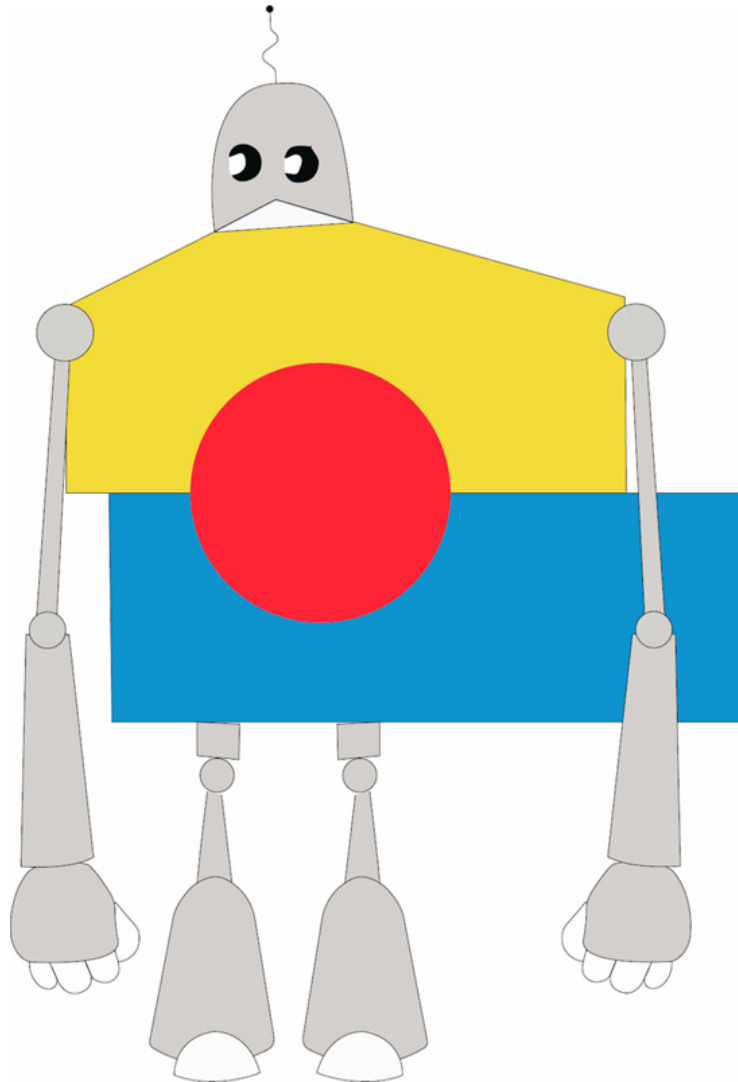
But one thing is for certain...change is coming, whether we like it or not!

¹ New homes built in UK annually

² The second half of the chessboard

CHAPTER ONE

Construction Technology (ConTech)



According to the Chancellor of the Exchequer in November 2017, we need to build 300,000 new homes a year to make housing in England more affordable and provide the nation's housing requirements. The Chartered Institute of Housing agrees that this figure would meet new and existing needs. The problem is that we are a long way from reaching anywhere near that number. In recent years we've been averaging about half of that. The last time 300,000 new homes were built was in in the 1969-1970 financial year!³

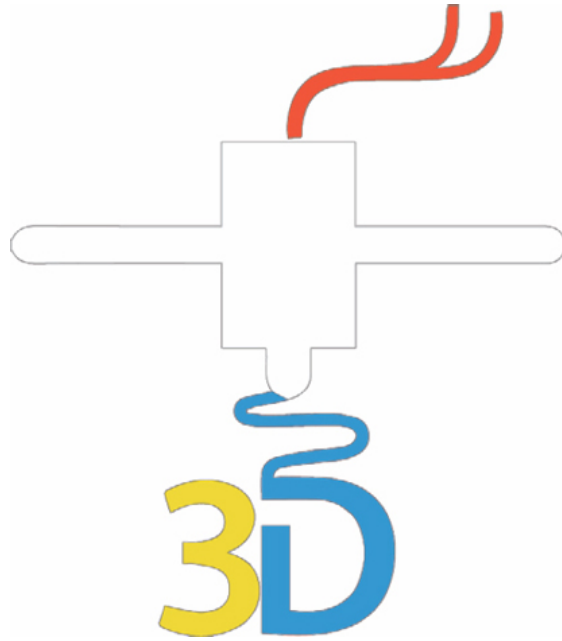
The reasons behind the massive gap between demand and supply are complex, and have much to do with the political and economic disincentives that have made council house building undesirable for local government. Construction also has a reputation for being an industry that is slow to adapt to

change. However, Construction Technology, or ConTech, is making great strides in creating new materials, tools and techniques that look set to transform the way we build.

The construction industry has a host of challenges to contend with. Increased focus by government on legislating for the construction of safe, sustainable and energy-saving buildings is an obvious one. However, there are also threats to the construction industry that are harder to spot. Construction is failing to attract young people to the industry and this is already being felt in skills shortages, as recruiters fail to find skilled staff to fill vacant jobs. I recently interviewed Mace Group's Director of Innovation, Matt Gough, and he told me that the industry faces a loss of 25% of the skilled workforce over the next 10 years, which is of great concern.

Can ConTech change the face of construction and help make building better quality homes faster, cheaper and with fewer skilled trades a reality? This chapter will help us to find out what's on the horizon for the construction sector and how recent technological advances will affect our lives, both as homeowners and investors.

BUILDING METHODS



The benefits - Key headlines

- Modular homes can be built in a factory in just 20 days and erected on-site in half a day.
- A robot bricklayer called Hadrian X can lay a staggering 1,000 bricks per hour. Compared to the average bricklayer who lays around 500 bricks per day.
- Small 3D-printed houses can be built in 24 – 48 hours.
- There is increasing focus on both more sustainable construction methods, more durable buildings and lower ongoing energy use due to climate change.

Modular Construction

The average building site is going to start looking a little different in the coming years. One of the biggest advances in construction technology is in modular housing, now the more common term for prefabrication. It's fair to say that the term, "prefab" probably sends shivers down the spine of the average homeowner or investor. Memories of poor quality, asbestos-ridden post-war housing still loom large. However, if you take into account that many of the original post-war prefabs were only meant to last ten years, actually they are pretty impressive. They also brought new-fangled technology, like central heating, built-in ovens and flushing toilets into homes at a time when such luxuries were a rarity.

Modern modular housing could be a great way of speeding up the pace of construction, while cutting costs and creating sustainability efficiencies. So much so that, at the time of writing, 68% of construction firms are investing in modular housing and 56% in construction with panels.⁴ Indeed, Legal and General and Berkeley Homes have both invested in their own pre-fabrication factories in the past year.⁵ Modular housing is mainly constructed off-site, right down to piping, cabling, paint and carpets, and then assembled on-site. Modular homes can be built in a factory in just 20 days and erected on-site in half a day. Berkeley Homes plans to build a factory in Kent capable of building 1,000 homes per year or 25% of its annual output.⁶

Another interesting point that came out of my discussion with Matt Gough was that recent RIBA research indicates that 75% of the general public would never buy a new home.⁷ Respondents cited

small rooms, a lack of style and not enough outside space as their top reasons for not considering new homes. People also expressed concern about not being able to change a new build as their life circumstances change, so for example accommodating a new baby, mobility issues or elderly parents.

Modular building techniques will make constructing much-needed housing quicker and cheaper, but will need to accommodate customisation, to create homes that are more in keeping with the residents' needs. The emergence of the custom-build trend will also help us to move away from the identikit square boxes that we have become used to in mass-housing projects. People like to be unique and so the addition of options and alterations that can personalise or customise a home will no doubt be a driver going forward.

3D Printing and Robots

There has been a lot on the news about 3D printing over the past few years, although not a lot of that coverage relates specifically to construction. However, there are advances being made in 3D printing for construction, particularly in conjunction with the use of robots.

The main benefit of both robots and 3D printing is that they enable on-site construction to take place, even in remote conditions and using locally sourced materials, if needed. This is already being seen as a potential solution for disaster relief, for example in earthquake zones where land-based transport is no longer functioning. If 3D printers or construction robots could be airlifted in, people whose homes have been destroyed could be re-housed quickly and cheaply. 3D printing and robotics could also be used as a solution for converting slums into better quality housing and even to speed up future colonisation of the Moon and Mars!

A robot bricklayer called Hadrian X being developed by Australian company Fastbricks Robotics can lay a staggering 1,000 bricks per hour. When I interviewed well-known property developer Andy Hubbard for YPN Magazine, he said that when he was an award-winning bricklayer he would lay around 800 bricks per day. Hadrian X can build the walls of an average-sized house in 48 hours, without rest...at least in theory.⁸

Digital design and manufacture, creating a 3D design on a computer and then using that file to programme the machines cutting materials to create an exact replica of the on-screen design, is a technology that has been used on homes in the UK. A house in Highgate, London, built in 2016,⁹ was widely reported as having been 3D printed, but in fact used the technique above. This is quite far from most people's understanding of 3D printing. With an average cost of around £2,100 per square-metre for this method, the High-gate house had a build time of over 18 months, although the discovery of a World War II bomb shelter on-site didn't help there! This home definitely did not benefit from the potential time and cost savings associated with 3D printing technology, although it did see an impressive increase in value. It was estimated to have been worth five times more than the house that previously stood on the plot. However, further afield homes have been 3D printed as you might expect.

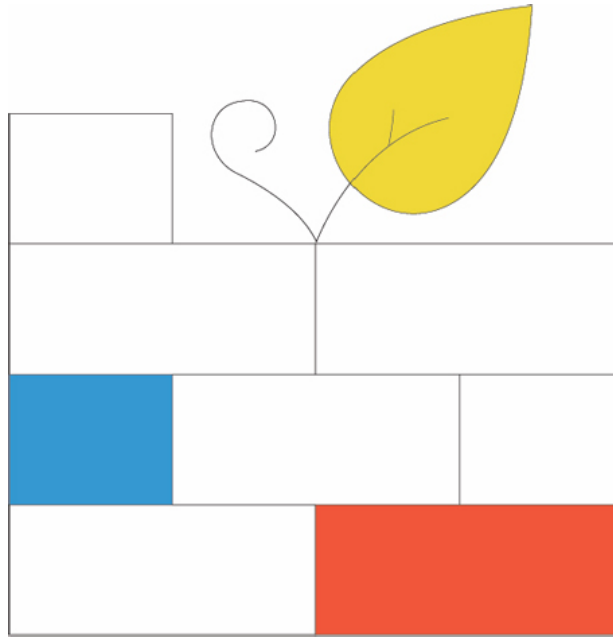
In March 2017, San Francisco start-up Apis Cor printed a 38 square metre house at their Russian test site in 24 hours, using fibre concrete with a stated life of 175 years. Workers had to fit the roof, windows, insulation and appliances, but the structure and weight-bearing walls were all 3D printed on site. The estimated cost of the house was US \$10,000.¹⁰ At the South By Southwest Festival 2018, in Austin, Texas a collaboration by US construction tech firm ICON 3D and non-profit organisation New Story won the SXSW Accelerator Pitch Event. The companies built a 3D printed house for \$10,000 in 48 hours in Austin, the first permitted 3D printed house in the US. The next stage of the project is to raise \$1,000,000 to build 100 homes in El Salvador over the next two years. Cost of the homes is expected to be \$4,000 in developing countries and production time is expected to drop to just 1224 hours. The major benefits of this sort of rapid, low cost construction are clear to see. However, in addition to the cost, time and resource savings, 3D printing buildings would cut down on the thousands of injuries and deaths on construction sites worldwide every year. Although numbers have dropped

substantially over the past 20 years, latest UK figures show that there were 30 deaths and 64,000 injuries on construction sites in 2016-2017.¹¹ Imagine how many deaths and injuries must be happening in developing nations where there is less focus on health and safety.

Up until now, 3D printing solutions have not been particularly cost-effective, which has made scaling up the technology problematic. Another challenge is regulation, for example making sure that a high standard of construction is maintained. Related to this are questions about lending and valuing for 3D printed buildings and insuring them.¹² Dan Hughes, well-known for his work as PropTech lead at RICS mentioned that regulators and assessors are often playing catch-up when it comes to technology advances, but they are working hard to contribute and shorten the gap. These are issues that will need to be resolved before 3D printing – and indeed other new construction methods and materials - become more mainstream. One of the big questions when it comes to new construction methods is client demand, as particularly when it comes to their home, people need to have confidence in the product. They literally want to know that their home is as safe as houses! However, this natural suspicion of new tech is now starting to change, it seems. For example, the United Arab Emirates government has said it wants 25 per cent of buildings to be 3D-printed by 2030. Whilst this is a far-away land, it spells out a trend of Governments and public bodies setting targets and driving demand for alternative technologies in the building methods adopted.

As things stand, the potential for 3D printing is clear to see. With so many inhabitants of our planet living in sub-standard accommodation, a solution that enables the safer construction of high-quality homes quickly and cheaply with minimal waste is highly desirable. However, certainly for the foreseeable future, we are more likely to see components of buildings rather than whole houses being 3D printed.¹³

ALTERNATIVE BUILDING MATERIALS



Green Materials

As climate change and an increasing global population place more stress upon the earth's natural resources, the search for more sustainable building materials intensifies, in addition to the drive to make properties more energy efficient. The environmental impact of the global construction industry is massive. The worldwide manufacture of cement contributes up to 10% of all industrial carbon dioxide emissions. On top of that, more frequent natural disasters are driving research into highly durable homes that can withstand extreme weather conditions and earthquakes.

Some of the technology being used is a new take on materials that have been used for hundreds or even thousands of years, such as straw bale, bamboo, wood and rammed earth. Modern technology and additives have transformed these ancient materials into desirable construction options for new-build homes. A great example of this is UK company, ModCell, which is combining straw bale construction with prefabrication to create better than zero-carbon buildings, including offices, schools, retail premises and homes, which are super-insulated and need almost no conventional heating after completion. The pre-fabricated panels consist of a wooden structural frame in-filled with straw bales and rendered with a breathable lime-based system. Getting a mortgage on buildings with non-standard construction can be an issue, but ModCell has gained Q Mark Accreditation, enabling owners to secure¹⁴ mortgages and insurance on their straw-bale buildings.

I mentioned the environmental impact of cement earlier on in this chapter. Cement is a major component in concrete, which is used extensively in current construction. One focus of research has been alternatives to traditional concrete, using more sustainable resources. Alternative forms of concrete using natural and waste products include HempCrete, LimeCrete, Timber-Crete and AshCrete – all of which have substantial environmental benefits over traditional concrete. However, as my podcast chat with Richard Hatfield and Malcolm McMahon from sustainable builders Greenheart revealed, these concrete alternatives are not without problems. Their experience with HempCrete has been that it is expensive and a tricky material to use, taking a very long time to dry, to the extent where it can seriously hold up a build. They felt that for now, HempCrete is for the serious green building enthusiast only!

In the UK, timber frame house building is becoming more mainstream as it is in other countries, such as the USA for example, where you find lots of timber frame homes. Although the idea of a timber-framed home conjures up images of Tudor cottages, modern timber frames are a far cry from the houses of old. They meet building regulations for thermal, acoustic and fire performance and use advanced breathable membranes, insulation and vapour control layers to ensure that lifespan is comparable to a house built of bricks and mortar. Timber-framed dwellings offer substantial benefits to self-builders and developers, as the timber frame is usually pre-fabricated off-site and then installed quickly on-site. It can take as little as 4-5 days to go from concrete slab to weathertight structure, which means that trades can carry on their work in a more protected environment and not be held up by bad weather. Timber framed houses can be constructed far more quickly than traditionally built homes, using a sustainable material. Mortgage and insurance companies make no distinction between timber framed and masonry-built houses when making decisions about lending and cover.¹⁵

New Materials and Methods

Since its isolation in 2004, graphene has been hailed as a 'wonder material'. If you haven't heard of it, here's all you need to know. Graphene is a single layer of tightly packed carbon atoms arranged in a hexagonal honeycomb lattice. It's amazingly thin, but although it's only one atom thick, it's the strongest compound known to man. You can add to that being the best conductor of heat at room temperature and graphene is also the best conductor of electricity as yet discovered. The material is 100 times stronger than steel, but it's also transparent and light in weight. Imagine the possibilities of a material with those properties. From medical applications, to water purification, to paint, the ways that graphene could be used are many. In construction, graphene could be used to create protective paints that combat corrosion and as a coating to create stronger, more durable steel. Other important potential construction uses are spray-on solar panels and self-cleaning concrete.

My podcast guest, Matt Gough of Mace Group mentioned self-healing concrete during our interview, a green invention which sees the addition of bacteria to concrete, either during manufacture or as a post-installation treatment. The bacteria are only activated when rainwater penetrates the concrete and then start to produce limestone to repair cracks. This technology could have a huge impact on the construction industry, as it has been designed to decrease the amount of new concrete needed and to lower maintenance and repair costs, not just for local government, but for building and home owners too. Concrete has a limited lifespan, as anyone travelling over the Hammer-smith Flyover into London in the early years of this decade will know! Hammersmith Flyover is on one of the major routes into London, but after serious structural defects were discovered in 2011, had to undergo disruptive major repair work for the next few years. Even though the work, costing £100 million, has solved the problem for now, the repairs have a lifespan of just 60 years. Depending on the quality of the concrete used and the structure's location, concrete buildings can have a surprisingly short lifespan. There was a scandal in China in 2013, when it was discovered that contractors had used sea sand rather than river sand to make concrete for the Ping'an International Finance Centre, Shenzhen, which had been slated to become the world's second tallest building in 2015. Using sea sand is much cheaper, but introduces a fatal mix of salt and chloride into the concrete that causes corrosion and affects structural integrity over time. An investigation found that the sub-standard concrete had been used on a further fifteen building projects. Scary stuff!

At the cutting edge of research is 'wave bending' technology, which allows materials to let sonic waves pass through it leaving the building in place. This would be useful in areas of high seismic activity, for example, minimising damage to homes and businesses from earthquakes. Nano-technology is currently creating unbreakable materials and turning the notion that heavy = strong and light = weak on its head.¹⁶ For now, it's a case of watch this space with nano-technology, as the research still needs to be scaled up to transform into real-life construction applications.

Fancy a house built of fungus? Hmm. I realise it doesn't sound very appealing. Yet mycelium bricks offer an amazing alternative to traditional construction materials. They are incredibly strong, fire, water

and mould resistant and can be grown into different shapes and forms to suit a project's needs. They are made of organic waste and mycelium fungus and need little processing to be ready for use. I expect that we'll be hearing more about mycelium brick in the coming years, but it will be interesting to see which of these cutting-edge materials end up being adopted and which go the way of the Betamax video player!






We've already covered modular construction in this chapter, where buildings are constructed off-site and then quickly installed on-site later. Modular materials are also being adopted by the construction industry. Structural Insulated Panels and Insulated Concrete Formwork are becoming more widely used and allow less time on site, quicker construction and often very much better energy efficiency too. In fact, UK ICF-specialist Logix recently published a news article on their website about how a customer had had to turn his heating on, for the first time in four years and for just four hours!¹⁷



Perhaps a very small and more everyday ConTech application that I recently became aware of was when I spoke with a contractor friend of mine. He has recently bought a paint gun which allows him to paint an entire house in about a day, or one hour per room! This potentially saves an immense amount of time on a project. He tells me that the finish is actually better than with an uneven roller, as well. Of course, he had to buy additional equipment and learn how to use it, but he also says that the investment is allowing him to increase his productivity at a staggering level as a result.

As my friend found out, skillsets and suppliers in the construction industry are starting to shift. As mentioned at the beginning of this chapter, we will see a 25% loss of the existing skilled workforce over the next 10 years, but at the same time we will also see a shift from brickly, chippy and sparky towards technician, programmer and engineer. Then, consider the fact that Google, Microsoft and Facebook are now not only building houses but small communities. Advances in 'last mile deliveries' from Amazon, autonomous vehicles and drones will change the way materials can get to site and revolutionise logistics, so we can expect to see greater use of technology in the building and construction industry from less familiar sources, I predict.

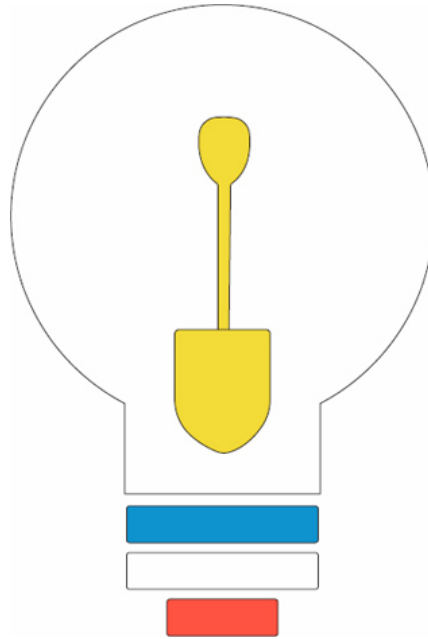
We also shouldn't forget that Big Brother is Watching! The Government is interested in increasing productivity, which means that not only is Research and Development money available, but policy changes will also start to take place to encourage greater adoption of technology. For small developers, the government is offering finance to support housebuilding projects that otherwise would not go ahead through the £4bn Home Building Fund and the Housing Growth Partnership.¹⁸ Besides funding being available for SMEs, or small developers in our case, the 'manufacturing of construction' agenda will no doubt encourage wider adoption of new building technologies than we have seen in the past couple of decades.

SNAPSHOT OF BUILDING METHODS & MATERIALS

METHOD	ADVANTAGES	DISADVANTAGES	AVAILABLE NOW?
MODULAR CONSTRUCTION	Can be built in a factory in 20 days and erected on site in half a day. Factory build means better quality, safer construction and no hold-ups from bad weather.	Little customisation available in most cases, except in high-end properties.	
3D PRINTING	A whole small house can be constructed on-site in 24 hours. Very little waste and safer construction. Opens up design possibilities.	Durability will depend on construction material.	
ROBOTIC CONSTRUCTION	Hadrian X robot bricklayer lays 1000 bricks per hour, compared to 500 a day for the average human. Safer construction.	Threatens bricklayer jobs, but skilled trades are in short supply, so could in fact be an advantage.	
STRUCTURED INSULATED PANELS (SIPs)	Faster build time, mostly off-site. Superior insulation means low running costs and superb energy efficiency.	Slightly more expensive than bricks and mortar, little scope for later design changes.	
INSULATED CONCRETE FORMWORK (ICF)	Faster build time, in this case mostly on-site. Impressive energy efficiency and low running costs.	Some say a concrete and polystyrene sandwich is not sustainable construction. Highly specialised construction method.	
STRAW BALE CONSTRUCTION	Cheaper, locally available	Traditional straw bale construction is highly	

	<p>material. Great insulator and aesthetically pleasing. Highly customisable and also available in factory-built panel form (ModCell), speeding up build time and enhancing quality.</p>	<p>dependent on weather - it can't be worked on in the wet. Specialist skills needed.</p>	
TIMBER FRAME	<p>Sustainable material, frame constructed off-site so on-site time is reduced. Great insulator</p>	<p>Quality of timber, workmanship and treatments crucial to avoid damage due to rot and to minimise damage in the case of fire.</p>	
			

DESIGN & BUILD



Build to Rent and Growth of the Private Rented Sector

As we're all aware, the Private Rented Sector is predicted to continue to grow over the coming years, as owning a property becomes ever harder due to high house prices and stagnant wages. PWC say that 60% of Londoners will be living in rented accommodation by 2025. Build-To-Rent (BTR) is one way of addressing the housing need. The massive Wembley Park development has permission to build 5,000 purpose-built rental properties and will eventually house up to 15,000 residents across 85 acres. London is leading the way with around 56,000 BTR units to date. Other major cities, such as Birmingham and Manchester are likely to follow suit.¹⁹

Could BTR become a more mainstream model for residential property investors and developers too? Imagine constructing your own BTLs! I am dipping a toe in the water with BTR, more with conversions than with new builds at the moment. Careful planning will need to go into the design and finish of BTR properties to ensure that they are fit for purpose. The emphasis will be on creating properties that are low maintenance, offer great energy efficiency and are durable, in addition to being affordable and attractive.

Self-Build and Custom-Build

When I interviewed Matt Gough for The Property Voice Podcast, he mentioned something about recent policy changes around custom build. Well, after the show, I did a bit of digging and located the Self-build and Custom Housebuilding Act 2015 (subsequently amended by the Housing and Planning Act 2016). This sets out a few points, including the requirement for local authorities to measure the local demand for self-build and custom-build, which it also defines. Apart from a requirement to maintain a register and to take into consideration self-build and custom-build requirements with future planning policy, I did not see a definite requirement or target to be met. So, it strikes me as measuring demand and raising awareness in the short-term at least.²⁰ Maybe one day, we will get to where Germany is currently, with 10% of additional development land being allotted to self-build.

In a later chapter, we'll look at global megatrends which will affect how we live in the future. This will have a huge impact on how we need to design and use properties. There are definitely emerging trends with co-living, assisted living and community living, which are all variations on the theme of supported social housing. Think of old-peoples' homes centred around medical and nursing services, or a co-operative community taking it turns to cook for one another, or young Millennials living in studios in an apartment complex and then sharing large communal spaces and facilities, such as cafes, cinemas and so on. The Collective is a great example of a property company creating co-living (and co-working) spaces for young people, in London. It opened The Old Oak in 2016 - the world's largest co-living space - offering residents private en-suite rooms with communal areas, restaurants, bars, a cinema and a gym!²¹

It is then, not so much of a stretch to consider the blurring of use in some properties to convert them into multi-function buildings, where work, rest & play meet. Just look at WeWork's move into WeLive for an example of this. The rise of the digital nomad is also giving rise to a whole new type of property demand. They want a property in Bali, that has superfast broadband, print facilities, a comfortable bed and a large kitchen-diner where they can intermingle with their peers and brainstorm start-up ideas...all before switching to Sydney or New York for a few months!

We are, as a society, having a much-needed rethink about how we use space in a home. We have micro-homes cropping up in high-density urban areas, such as London. The multi-generational home allows up to three generations of the same family to co-habit, but all with very different needs. Finally, easy access and mobility homes such as bungalows are favoured by the elderly, but are in short supply right now.

The emergence of the Sharing Economy (covered in-depth in a later chapter) is bringing about changes in how we use properties and also their economic models too. Just look at what Airbnb has done for short-term rentals and the previously mentioned WeWork, with hot desk office space, as two such examples. Other technological developments are making the emergence of new business models increasingly more viable and within reach of even the smallest property investor now. Open your smartphone, download an app and upload a short-term rental listing in minutes. Who would have thought of that just 5 or 10 years ago?

Energy Efficiency

The first thing to say about energy, is that we don't have enough of it...well, certainly not enough of the carbon variety at least! By some estimations, we will run out of carbon fuels by 2050 and perhaps more worryingly, if we delay the point in time when we decide to switch to non-carbon fuels, it might be too late. I might not be around come 2050, but I have children who will be, so we have a responsibility to the next generations to do something before it's too late.

That said, there is a difference between installing energy-efficient systems in new developments compared to the existing housing stock. Passive House (or PassivHaus, to give it its original German name) is a rigorous, voluntary standard for energy efficiency in a building which results in ultra-low energy buildings that require little energy for space heating or cooling. Passive House buildings, both residential and commercial, are becoming much more popular, particularly in Germany and Scandinavia but also here in the UK. The standard can be applied to refurbishments, but is far more easily applied to new-builds. When I interviewed Richard and Malcolm from Greenheart, they highlighted the fact that retrofit or refurbishment can be a particular challenge, with aspects like materials, site access, design, water and condensation all proving problematic. But ease does not absolve our responsibility. Smart home technology enabled by the Internet of Things will help with the roll out of energy-efficient homes for sure, but I don't want to spoil the surprise coming in a later chapter, so I will leave it at that for now.

Growth sectors in Self-Build - potentially using the Passive House standard -Self-Finish and Build To Rent will help to drive greater adoption and a longer-term view of the business case, as occupants, owners and long-term investors will have a greater vested interest in a building's running costs. There is a push and pull with this agenda. Some of the stakeholders around the property market can hamper progress, such as large housebuilders looking to build low-cost units to a minimum standard for maximum profit, banks looking for short-term gains, planners limiting new build development and surveyors not signing off on certain building methods and materials. However, the general public want decent, affordable and energy-efficient homes at the same time, so there is a demand, just not an organised and co-ordinated one as such. We are starting to see a significant impact from moves by Government, pressure groups and industry associations to ramp up adoption of energy efficiency measures.

Even if we don't take ownership of the planet's precious resources personally, the Government is helping us to take notice. For example, with laws affecting landlords around energy efficiency. From 1st April 2018, all new lets and renewals in the private rented sector have needed an energy efficiency (EPC) rating of E or better. This will impact all existing private rented properties and tenancies from 1st April 2020. If your rental property does not have an EPC rating of at least E, then you will not be allowed to rent it out. If you do try and rent an F or G rated property out, you could be fined £4,000 for doing so. That's quite a big incentive to look at upgrading the heating system wouldn't you say?²²

It might sound scary and expensive, but a UK Green Building Council Report suggests the average cost of bringing a property up to Band E level is around £1,400, with 70 per cent of landlords facing a bill of around £1,000. Definitely better than a £4,000 fine!²³ If the minimum energy ratings that prevent us from letting properties or serving a Section 21 Notice -along with the fines for landlords -are the stick, the Domestic Renewable Heat Incentive or RHI might just be the carrot. The RHI is a government scheme available to property owners to encourage the installation of sustainable energy systems instead of the old carbon-fuel systems of gas and grid-electricity that we have become accustomed to.²⁴ The scheme covers solar thermal, biomass and both air and ground source heat pumps systems and gives property owners quarterly payments for seven years based on the energy their new system has produced. Support to cover upfront costs is also available, with an 'investor' helping to fund the system's installation and then being assigned the owner's quarterly payments.

As came out of my podcast discussion with Richard & Malcolm from Green-heart, Sustainable Building can marry the two worlds of the green, ecological agenda to the property investor's commercial agenda. There is often a business case that supports the drive as well as the purely environmental considerations.

Conclusions

There are some breakthroughs that are already with us and others that may be a way off yet still. I don't see us colonising Mars with 3D printed homes anytime soon, but I can see the reality of factory-built homes or at least parts for homes emerging to meet the housing supply shortage we currently have.

Some new materials really do seem to be space-age, but as science progresses, so too does the discovery of new applications or improvements to some older materials too. So, if not Hempcrete, then perhaps that self-healing concrete that Matt referred to could be hitting specifiers' radars pretty soon.

I have absolutely no doubt that Build-To-Rent will see a massive push over the coming years. Developments will be required for all tenures, including rental, so the development of homes where the original buyer has a vested interest in the long-term operating costs of that building will surely produce a drive towards higher quality and greater sustainability.

The energy agenda cannot be understated, it is one of the most significant problems that this generation will have to tackle in my opinion. Expect more carrots and sticks, as incentives do tend to

work. However, also expect to see enhancements in technology that will enable the more widespread adoption of more energy-efficient homes to meet the increased demand that these incentives will drive.

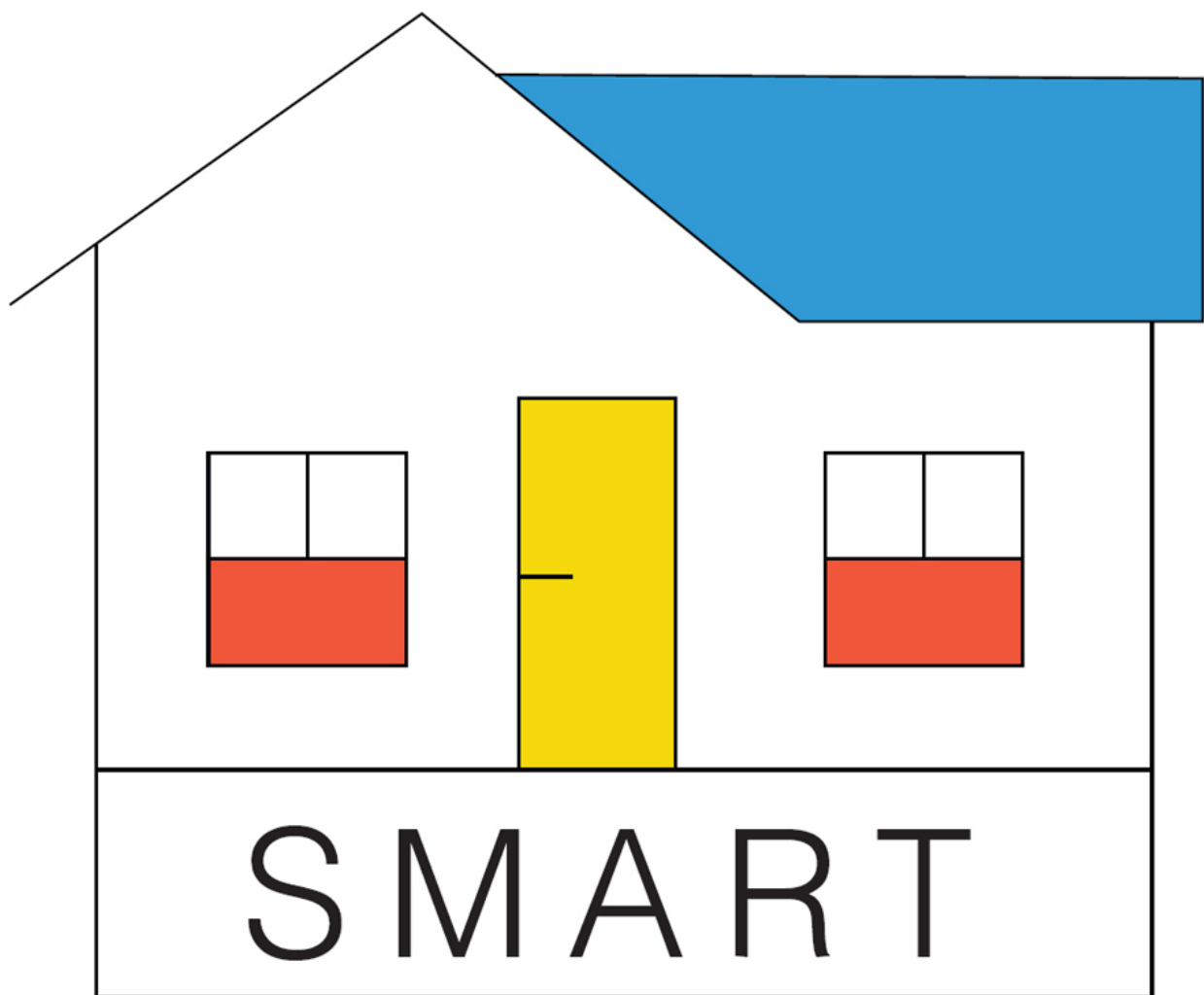
Personally speaking, I see some overlap in some of these technologies, policies and trends. We need more homes and so factory-built housing or on-site 3D printing just seems to make sense to help with that. We are losing skills in the construction industry, so technological advancements can help to plug the gap. We also need to fix the increasing energy crisis that is bubbling away, so the emergence of sustainable energy alternatives, designed in a Passive House and built using a timber frame and panel-based units just seems to add up.

I see opportunities for us investors and developers, but also some threats as well. We cannot continue to bury our heads in the sand and just wait until we have no choice but to comply. We might already be extinct by then if we do! Joining the dots in all this construction technological development is going to be interesting to say the least, so I suggest you keep a close eye on developments over the coming years.

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 - [4](#) Increasing investment in modular construction
 - [5](#) LG invests in modular construction
 - [6](#) Berkeley Homes build modular homes factory
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 - [8](#) Hadrian X robot bricklayer
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CHAPTER TWO

Smart Homes & The Internet of Things



Home automation, or smart home technology, has become big news over the past few years. Although the sector has existed for twenty years or more, the arrival of big names like Google, Amazon and

Apple has disrupted the marketplace and made more home automation far more accessible. The widespread adoption of smartphones and tablets and the increase in the speed and availability of fast, wireless internet connections has led to a massive increase in the possibilities that the technology offers.

In fact, the arrival of devices like Amazon's Alexa and Google's Play, among others, has brought about a kind of two-speed Smart Homes market. Prior to this, we might have associated connected devices with the 'footballer's home' no doubt, as they had sound systems, throughout the house TV and fancy lighting - all connected through a remote control or wall-mounted device. Add in some electric gates, CCTV and audio / video door access control and you had a snazzy home automation system on Millionaires' Row. But much of this is now also possible through the 'off-the-shelf' and 'plug and play' devices mentioned here.

My guest on The Property Voice Podcast, Andy Cox from ThroughMyTV.com made this point very well, I think. There is the DIY market, with its more limited functionality and capability devices and then there is the more professional market, where expert technicians write code and programs that interface with various devices to make the whole thing automated and discreet. The arrival of APIs and other technologies that help different devices and protocols talk to one another is a bit of a link between the two, although you would probably need to more than simply drag and drop to get them working together effectively...unless you happen to be a fourteen-year-old that is!

From a cost point of view, we have seen these come down from thousands to hundreds of pounds, which has also made such technology accessible to a larger potential market than was the case previously.

The other driving factor is connectivity and especially Internet connectivity. It is fair to say that with the lower cost devices that having good Broadband, Wi-Fi and / or 3/4G Mobile Internet

coverage is an absolute must. Connectivity is therefore the backbone of Smart Home technology. The one thing that should make every property investor and developer sit up is the fact that one of the first things prospective house-buyers and tenants do when considering a property, is to check the broadband coverage before even booking a viewing! Even when at a viewing, people will often whip out their phones to see the 3/4G coverage, with low bars equating to them discounting the property.

With rented properties, it's not just the initial let where this comes into play either, if tenants have problems with their on-demand services, such as Spotify and Netflix, they will serve notice and move on... leaving a potential void rental period and re-letting fees behind as they go. This costs us money. Conversely, offering included services can also be a differentiator or command a premium as well...leading to higher demand, shorter vacancy period between tenancies and higher rents. Offering an inclusive Amazon Fire Stick, Netflix subscription or as Andy Cox mentioned when we spoke, Sonos speakers with a free Spotify subscription, can set our properties apart from the competition. Equally, as another guest of mine, James Davies from upad said, he offers his own rental properties with superfast broadband already included within the rent, which saves the tenant the time and slog of getting themselves set up.

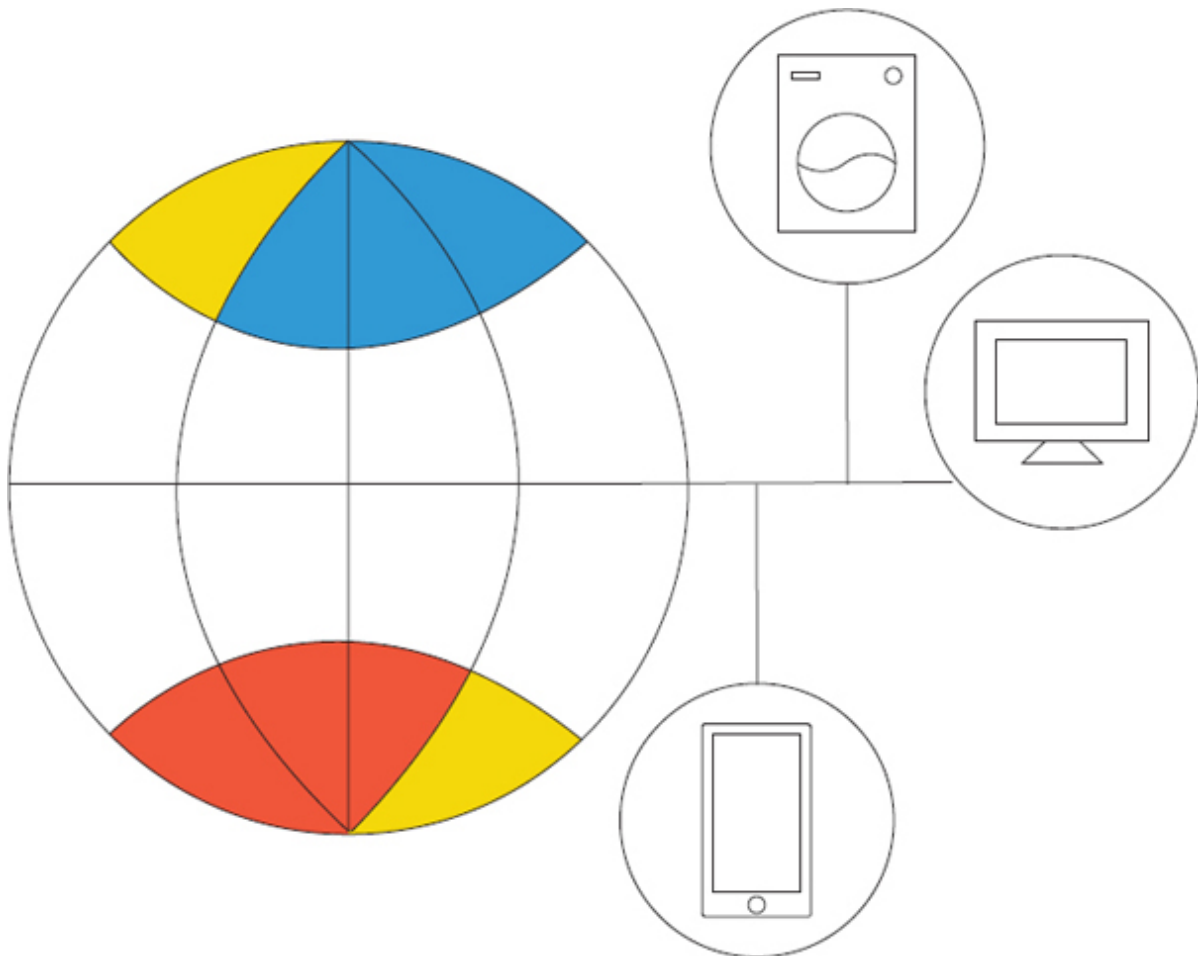
Whilst Broadband and Mobile Internet coverage is the backbone of smart home technology, it also has some potential limitations on its successful application at times. Have you ever tried checking how many Wi-Fi connections are visible when you connect a device to your Wi-Fi Internet? You will probably see signals from several of your neighbours as well as your own and this means the Wi-Fi frequency could also be congested too. Indeed, Andy Cox also made reference to his own experience as a professional in staller, where 7 in 10 Wi-Fi-enabled smart home solutions would probably be bug-free. This leaves around 30% where bugs could be expected, which is mainly down to coverage and bandwidth issues. So, the smart

option is to go for a more closed or hard-wired solution, rather than a more open interface that relies on Wi-Fi and 3/4G.

This also touches on another point...security. When I interviewed Greg Lindsay (see chapter 8 The Big Picture), he made a good case for being extremely concerned about hacking and data theft by criminals exploiting weaknesses in our smart home systems. So, a hard-wired system also reduces the possibilities there too. Besides security, having a hard-wired system can also help to set zones and limit bandwidth from 'heavy users' that may affect the other occupants of a property. Consider a home worker having their work interrupted by a heavy gaming teenager, or tenants in a shared house having their Netflix box-set binge fest disturbed by a Bitcoin miner in another room and you can see the potential merit of adopting this sort of zoning or 'quality of service' restriction.

This idea of hard-wired systems also highlights the difference between installation in new build properties versus retrofitting into older homes. Clearly, the best time to install cabling and the other infrastructure of a smart home would be at the design and build stage. With older properties, the best time to look at things would be during a refurbishment. However, failing that, there are still some decent retrofit solutions that you can install, which would then rely on Wi-Fi or 3/4G to operate too.

INTERNET OF THINGS



Smart home tech is closely linked to the Internet of Things. So, what is the Internet of Things? In simple terms, it is the Wi-Fi or mobile connection of any device to the Internet, which then allows these devices to talk to each other and share information. These days this could be a central heating system, a video doorbell, a door lock, a fridge, a kettle, a music system, a power socket, an alarm system....the possibilities are limitless. Once the connection to the internet is established, that system, device or appliance can then be controlled remotely by computer, smartphone or tablet.

As mentioned previously, wider smartphone and tablet adoption has broadened the scope of home automation. This has also made it

cheaper and much easier for the average homeowner or landlord / property investor to implement home automation. Home automation allows multiple devices to talk to each other and share information, with the aim of making the property owner's life easier and more comfortable. A combination of Wi-Fi and / or Internet enabled devices and sensors is the basis of smart home technology. Backed up by cloud-based services and rules-based programming software, like IFTTT (If This Then That), Stingify or Zapier and the power of home automation is mind-boggling. To illustrate, IFTTT is a free cloud-based software that helps devices and apps to talk to each other, and makes certain things happen if particular conditions are met. I know that's a bit vague, but don't worry, we're going to move on to the things you can actually do with the tech now. Naturally, we'll be looking at ways that smart home technology can help landlords and property investors to run their businesses better – saving both time and money.

Applications

Energy Saving

Heating

With a Wi-Fi enabled central heating system, you have complete control of when and where your heating is used. You can eliminate coming home to a cold house if you leave work early, for example, by using your smartphone to put the heating on. If there are rooms that are rarely used, you can set the thermostat accordingly and with individual TRV valves on radiators can also control rooms or zones independently to make sure that energy is not being wasted. The two biggest names in the UK smart thermostat market currently are the Google-owned Nest and British Gas' Hive. Most of the big energy companies have smart thermostat devices, both for sale and in the case of the SSE-owned tado, for rent. Many well-known traditional thermostat and boiler manufacturers have also got in on the smart thermostat action.

Nest is an impressive piece of kit, that uses artificial intelligence to actually learn how you use your heating system. This means that if you usually turn the heating down when you go to work and turn it back up when you come home, it will know that and start creating that pattern automatically. It has a motion sensor that picks up when the house is empty and automatically turns the heating down to a safe, but minimal level. This means, for example, that you no longer need to program the system if you're going away on holiday. Wi-Fi connectivity means that the device can access weather reports and adjust the time the heating comes on in the morning accordingly if there's been a frost or warm night. Nest cites average savings on a UK household's heating bill of 8.4% – 16.5%²⁵, although Andy Cox mentioned that he had seen some manufacturers using learning algorithms quote savings of up to 30% a year.

There's now a specific smart thermostat aimed at UK HMO and holiday let owners,²⁶ which gives remote control over a property's central heating. If your HMO tenants' idea of controlling the temperature of their home is by leaving the heating on 24/7 and then opening the window when it gets too hot, this is a great solution. You can remotely set minimum and maximum temperatures so that the occupiers of the property can't do crazy things like set the thermostat to 30 degrees Celsius. Holiday let owners face different challenges. Using a smart thermostat ensures that you can make sure your property is protected from frost, but not over-heated, when there are no guests staying. The company that makes the landlord thermostat, Inspire Home Automation, cites an average saving of £165 per year, per property, on energy bills. When I was a student, we used to have the heating on full blast and then open the windows to cool down! These systems will help to avoid that situation arising, especially if radiators are fitted with TRV valves and rooms have open window sensors.

Even in a standard 'vanilla' BTL property, saving energy using smart home tech leads to benefits for both landlord and tenants. If you can get a better EPC rating for your rental property, it will be more

attractive to tenants, because it will be warmer and less likely to suffer from mould, alongside generating lower energy bills. Carrying out energy efficiency improvements is also likely to boost the value of the property, if and when you choose to sell it.

Smart Lighting and Electrical Equipment

Using your smartphone or a smart home hub (such as Amazon Echo, Google Home or Apple HomeKit) you can change the colours of your smart lights, switch them on or off remotely, or even create specific scenes when you give an audio command like “film night” or more romantically “date night”, for example.

As Andy Cox, my podcast guest from ThroughMyTV.com explained, you can programme the lights within a smart home system to make your life easier. You could ask your home hub to monitor the overnight temperature on the weather forecast. If there’s going to be a frost, you could make your hall light turn blue between 6am and 8am, say, so that you know when you come down the stairs that if the light’s blue you need to allow extra time to defrost the car that morning.

With more expensive, installed smart home systems like Loxone, for example, you can programme your smart home system to use lighting to enhance safety and security. So, if someone gets up in the night to go to the loo, the way is illuminated with low-level lighting, that’s not too much of a shock to the system! At the opposite end of the jarring scale, Loxone also make use of lighting as part of their security and fire alarm systems. If an intruder comes into your property, not only will the system alert the owner if they’re away from home, but the lighting system will flash brightly to attract attention. Couple this with your choice of music (Flight of The Valkyries or Who Let the Dogs Out, anyone?) or voice message at top volume and I suspect the average burglar will not be sticking around for long!

One of the most attractive aspects of smart lighting is the ability to choose your desired hue from millions of colours, to create stunning

lighting scenes. Although you'll probably have a small selection of favourites, creating a movie night, romantic dinner or disco lighting scene is an easy way to change the ambience of your home radically at the touch of a button or with just a word or two.

However, fancy smart lighting is probably beyond the scope of most rental properties' needs. There are plenty of other, low-cost ways to make savings on electrical usage. Low energy light bulbs are obviously a great way to start bringing down energy usage. Many of us are guilty of not turning off electrical items or leaving them on standby when we're not using them. Smart sockets and extension cables allow us to use either voice commands via digital assistants or apps on a phone or tablet to switch sockets on or off. Some of them even offer timer or IFTTT functionality, allowing appliances to be switched on or off at certain times, optimising energy use. A smart extension cable can be bought online for as little as £25-30 and smart sockets can be had for just over a tenner.

Safety and security

I've already covered how smart lighting can be used in a smart home security system, but there are many other ways that a smart home can make your home safer and more secure. A Wi-Fi enabled video doorbell will let you see - even if you're not home, via your smartphone - who is ringing your doorbell and answer it. If you're expecting a tradesman or delivery driver, if you have a smart lock on your front door, you can let them in even when you're not there. This has benefits for remote property investors, clearly. Although you would still need to give tenants or guests notice of an agent or tradesman's visit, no-one would necessarily need to stay at home to let them in, which is often tricky to arrange.

Smart home fire alarm systems can work in a similar way to the security system mentioned in the previous section, using sensors to detect smoke and fires and immediately notify the owners. Similarly, there are smart carbon monoxide monitors that do the same thing. These connected alarms can do clever things like send you a

message when the battery runs out, making managing your portfolio that bit easier. Leak detection systems place sensors, often in areas like utility rooms, kitchens and bathrooms, to give instant notification of water leaks in order to minimise damage. There are even damp sensors that can detect when inadequate ventilation is creating conditions ripe for mould growth. If we take this idea forward, there's no reason why we couldn't then remotely activate an extractor fan or open a window, perhaps not now, but within the next few years at most.

When tenants leave a property, many property investors have the locks changed. I know of many landlords who are constantly accompanied by the jangling of a massive bunch of keys wherever they go. It's hard to keep track of keys, even when you have a modest portfolio. However, smart locks could be the answer to this. If they are managed via a key code, set remotely, it's easy to simply change the code when a tenant leaves. This is also incredibly valuable for the owners of holiday lets and serviced accommodation properties. No need to have a key safe outside, with the chance that the last guests don't return the key! That's happened to me before.

CCTV and other camera monitoring can also be installed and in some cases might need to be connected to a power supply (using solar power) or a Broadband-enabled telephone line (using 3/4G). This could be very useful for short-term rental operators or developers where properties are empty overnight or for long periods of time.

Assisted Living

As we'll see in a later chapter, one of the global trends that we are seeing in developed nations is an ageing population. People are living longer, but sadly this also means that there will be more members of our communities with chronic health conditions and poor mobility. Many of us will have seen elderly relatives become infirm, but not want to go into a care home. This independent spirit is admirable but can cause huge worry for loved ones. Voice activated home automation can make it much easier to carry out repetitive tasks

around the home, like getting up to turn lights on or off, turn sockets on and off or see who's at the door from a tablet (without needing to know which buttons to press) rather than getting up. Smart home technology is being developed where someone's regular habits and movement can be tracked automatically by sensors. If say, Mum doesn't put the kettle on by 9am, or go to the bathroom at certain intervals, then an alert can be sent out to family, friends or carers letting them know that they might want to check in on. The parameters for this are limitless and can be precisely tailored to the vulnerable person's routine. If you add cameras to the system, strictly with the resident's permission, then if there was a concern you could switch the cameras on and make a visual wellbeing check. If elderly or infirm relatives are able to stay in their own homes for longer, with less worry for relatives, then surely that's a win-win situation. With older people making up an increasing number of households, this sort of technology is also something that property investors might want to consider in rental properties that are likely to appeal to less mobile tenants, such as bungalows.

THE PROS & CONS OF SMART HOME TECHNOLOGY

PROS	CONS
Automates processes - smart home technology can automate some processes and streamline others, making managing rental properties easier.	Upfront cost - although you don't have to spend a fortune, investing in smart home tech does carry an initial cost.
Makes your properties stand out - energy saving smart home tech can make properties more attractive to tenants and potential buyers, which can help you to stand out in a competitive marketplace. You might even be able to charge a bit more rent or get a little higher sales price.	Lifespan - as by definition, smart home tech is connected to the internet and often relies on apps as the primary control interface, it's worth asking the question about the expected lifespan not just of the device in question but supporting apps and software too.
Safeguards your investment - if your rental property is warm and dry, your property is less likely to suffer from problems related to damp. With connected alarms, be they burglar, leak detection, fire	Security - there are plenty of questions about opening up your home (or rental property) up to a slew of devices that are connected to the internet. Hacking, malware and viruses all have the potential to do even greater harm across a large home

<p>or carbon monoxide, you are notified if there are any problems immediately.</p>	<p>network connected to your fridge, your burglar alarm, your boiler among others and payment mechanisms.</p>
<p>Smart homes technology helps with property management - for example, with a smart lock on the front door, you can easily control access to the property, allowing contractors to enter easily and saving money on changing the locks when tenants move out. Or you might want to turn the heating down remotely in that student house, which has the heating on full blast, but with all the windows open (yes, I did that way back when!).</p>	<p>Data privacy and choice - it looks like the major data collectors or 'GAFA': Google, Amazon, Facebook and Apple will gain the most from smart home technology in the long run. There are some hints that Amazon may be considering looking into smart fridges, that keep an eye on spoilage and might even order food (delivered right into your fridge potentially) for you so you never run out of milk, for example. Will this mean that we have less choice in future service providers? And who could see your pickled onion fetish?</p>
<p>Low cost - certainly there is plenty of smart home tech that doesn't cost the earth but does make a positive difference to tenants and property owners alike.</p>	<p>'Bandwidth poverty' - smart Home Technology is dependent on fast, reliable Wi-Fi and potentially also Internet access. What happens in areas of the country or world that don't have access to this? For example, remote rural locations and areas of the developing world. Is there a danger of digital haves and have nots? Don't worry, it seems that Fleet, an Australian start-up, has got us covered by creating a network of nano-satellites with the specific</p>

	aim of supporting IoT connectivity regardless of location.
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Conclusion

Smart Home technology is literally exploding over recent times. This has been fuelled by a couple of significant drivers. Firstly, high-speed, super-fast Broadband Internet and 3/4G Mobile Internet connectivity has provided the backbone or platform for inter-connected devices to proliferate. Secondly, the big players like Google, Amazon and Apple have entered the market of more established industries like home automation, remote control and access and home energy management with low-cost, off-the-shelf devices that are simple to use. No longer do you need to be a professional footballer to do some clever things at home.

The rise of APIs, user-interfaces and connectivity linking programs such as IFTTT have meant that the convergence of different technologies, previously a significant stumbling block, has become a whole lot easier. Now you can potentially control your property literally from anywhere you like on just a smartphone.

There are some external drivers that are pushing the roll out of such technologies. These include the energy-efficiency agenda, aging population and the changing nature of how we use our properties where home-meets-work-meets play. On the pull side, homeworking and on-demand services like Spotify and Netflix are making property investors and developers think more carefully about where they build or buy (meaning good broadband and mobile coverage) but also how a property is fitted out (meaning cabled networks, Wi-Fi signal boosters and installed services).

Beyond the convenience, comfort and lifestyle factors presented by these developments, cost-savings, rent premiums, reduced vacancy periods and asset protection should capture our attention, even if the green agenda and Millennial's tech-heavy needs do not. We can

either join in with this connectivity revolution or sit by idly and then become extinct as we are literally left behind. After all, Home automation is set to be present in 25% of UK homes by 2020 according to IFSEC GLOBAL.²⁷

In the near-future we are going to see more connected devices using the Internet of Things, more touch control, which will move increasingly to voice-controlled devices. External connectivity and internal cabling infra structure will inevitably be a BIG part of people's housing decisions. So, consider the Broadband and Mobile Internet coverage in your properties, hard-wired cable zones, USB charging points and that superfast Wi-Fi signals are boosted all around the property if you want to at least get to first base with these changes. The rest can then be added on top more easily and cost-effectively if these fundamentals are in place.

On the downside, cybersecurity is a risk area and so take careful steps in the solution that you choose to adopt with closed or hard-wired solutions and adequate firewalls and other security measures being applied wherever possible. Equally, bandwidth congestion and signal interference could limit some of the potential too, so again hard-wired systems might be the best interim step for now.

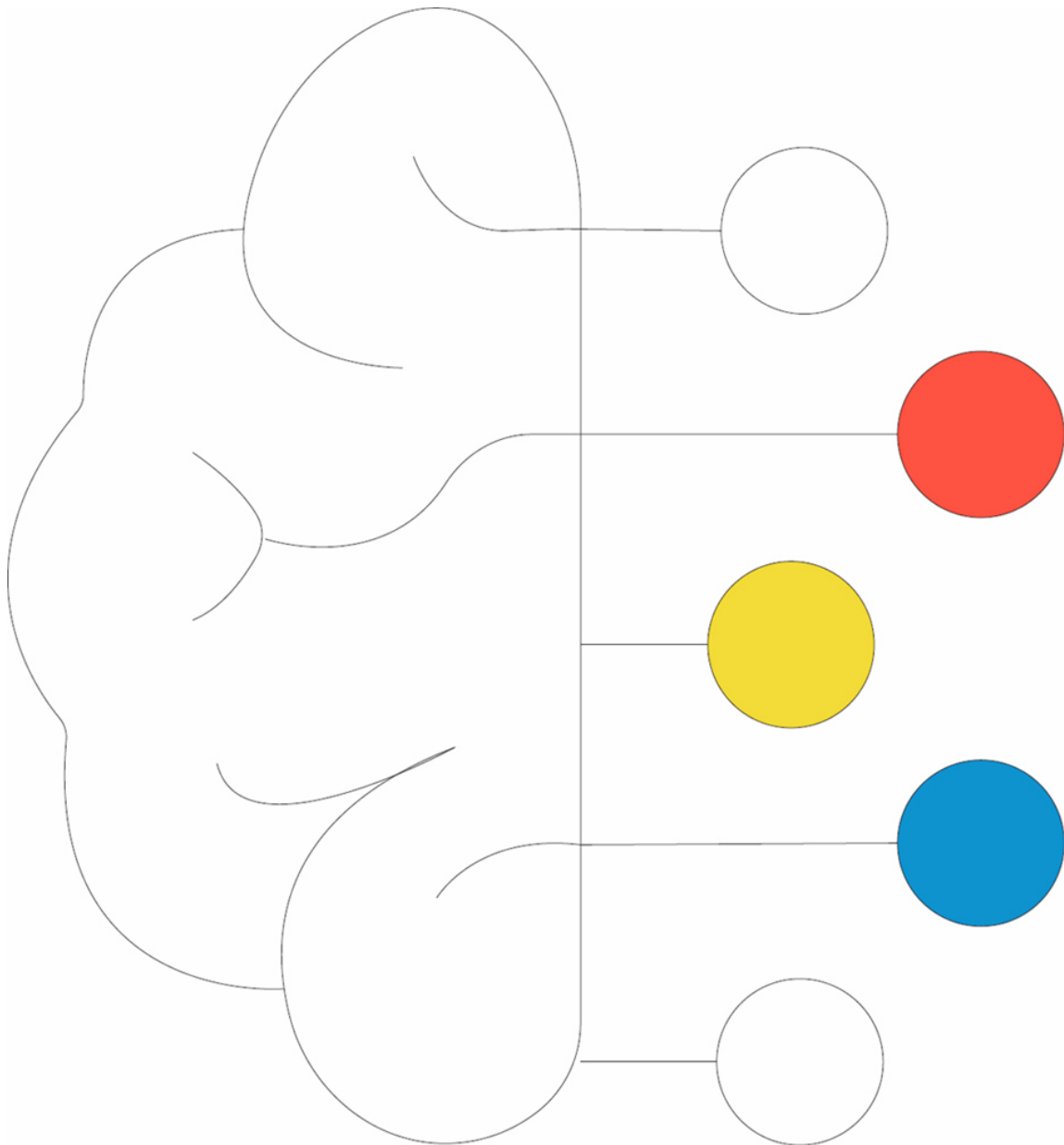
²⁵ Nest - average savings

²⁶ Landlord thermostat average savings

²⁷ IFSEC Global home automation report

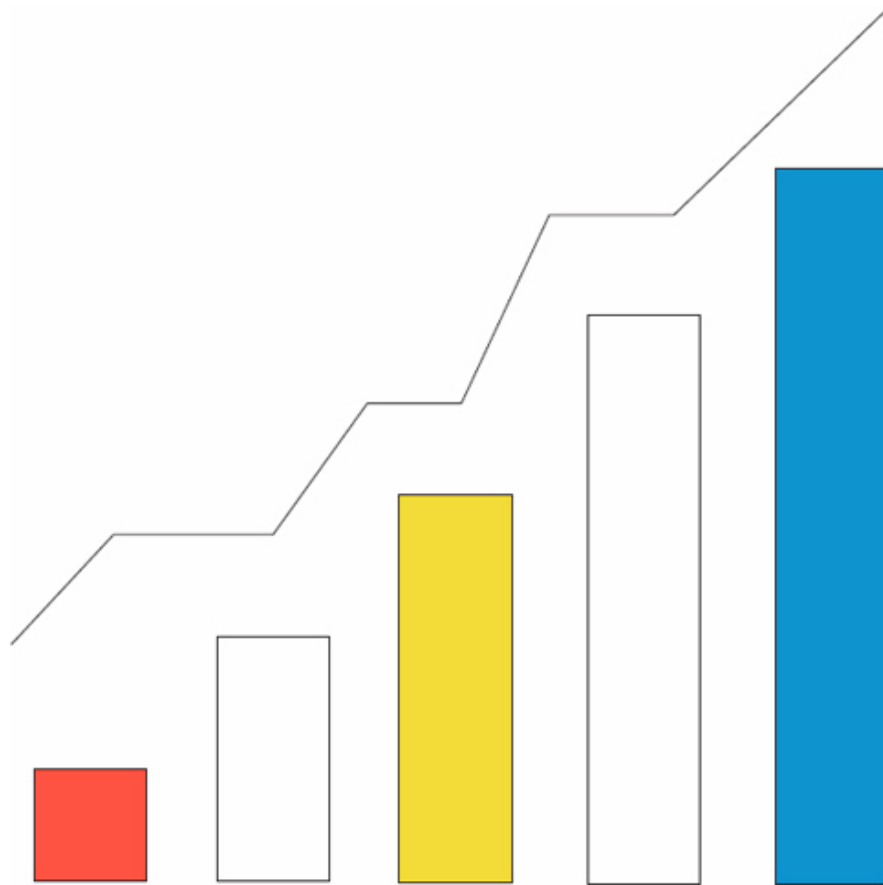
CHAPTER THREE

Big Data, Artificial Intelligence, Tools & Apps



It's hard work being a landlord or property investor, as I'm sure many readers will agree. I'm always really interested to find out how technology can help landlords and investors to run their portfolios more easily and effectively. There's a list of useful systems, apps and tools aimed landlords and investors later on in this chapter – and we'll keep updating a links document that readers are very welcome to request. Just go to the very helpful Book Bonus page in the Conclusion and Next Steps chapter, just follow the instructions and you can stay up to date. However, I also think we need to understand how and why these tools have come about and what technology promises to bring us in the future.

BIG DATA



You know how, if you're on Facebook, adverts that match what you have recently been googling on the web pop up? Annoying, isn't it?! However, this is a great example of how big data is used to better tailor products and services to our needs. We all create immense amounts of data in our daily lives. The use of smartphones, Wi-Fi and geo-location combine to create a vivid picture of what we do, where we go and what we like, or dislike. The common factor here is the internet, and increasingly the mobile internet, which is at the root of the masses of data that is now being produced. The analysis of this data can be used to spot patterns, trends and associations. There are some amazing statistics relating to the growth of data and the reasons for that increase over the past few years.

- Between 2014 and 2017 the number of people using the internet globally grew from 2.4 to 3.8 billion. An increase of a whopping 42% in just three years.²⁸

- 90% of world data had been created during the previous two years, an IBM report found in 2017.
- In 2017, IDC (a well-respected market research agency specialising in the tech industry) predicted that the amount of data existing in the world would increase to over TEN TIMES what it is today by 2025, mostly created by organisations.

It's not just data relating to individuals though. Governments, institutions and companies are also harvesting and transmitting reams of anonymous data about places, transactions and people. This data is then analysed and used by different organisations to create easily accessible, useful information. In property, think about how Rightmove, Zoopla, upad, Spareroom.com and the Land Registry, to name a few, enable a huge amount of research to be done by a potential developer, buyer or tenant before ever needing to contact an estate agent.

Poor old bricks and mortar estate agents seem to be having a hard time of it these days, with competition from online and hybrid agents with lower running costs. However, contrary to what you might think, big data could also be a positive development for traditional agents. That depends on whether they are able to see the benefits of new technology and run with it. In a blog post from 2016, Gavriel Merkado of REalyse - a software company offering UK residential investment data and insights, gained through big data analysis -stated that the real estate sector was around 30 years behind the financial sector in term of developments in data tech.²⁹ Merkado observes that mass digitisation brought lower transaction costs to the financial sector and a huge increase in the number of transactions. We can see this happening in real estate now with the increase in online, fixed-fee estate agents like Emoov and Purplebricks. A common theme that I've encountered while I've been immersing myself in the world of Prop Tech to research this book is that "anything a machine can do; a machine will do" as Merkado succinctly puts it. Robots and computers taking human jobs is of great concern to many, but in the case of estate agency, this should drive business efficiency and give customers a better service. If computers can do all the routine administrative tasks, then estate agents will have more time to spend on building relationships and working on consultative sales.

As I mentioned previously, Big Data will take the guesswork out of trends, areas of demand, valuations, investor and homeowner research - saving

time and lowering risk. Another area that will be heavily affected by Big Data and Artificial Intelligence is specialist property services, like conveyancing, surveying and legal work. Notably, in late 2017, Big Property Data launched, offering a cloud-based property report service for the conveyancing market that takes on average just 60 seconds to access 150 data-sets, with three hundred million points of data. Compare this to the hours or days required to complete searches until now and it is quite clear that harnessing property technology in this way will revolutionise conveyancing. An interesting example of an online, fixed-fee agent that has taken legal and valuation services in-house is Settled.³⁰ The company, founded in 2016, claims that their in-house legal services take 4 weeks off the average completion process and costs half the price of traditional legal fees. They have also launched an interesting optional service called Strengthen and Secure to tackle the estimated 1 in 3 sales falling through due to gazumping, gazundering or gazanging; the latter of which was a new term for a familiar problem for me too!³¹ Buyer, seller or both opt in to use Settled's conveyancing partner and pay a refundable £500 deposit to join the scheme. According to Settled, the scheme saw a 100% completion rate where both parties joined, in the first few months after launch.³²

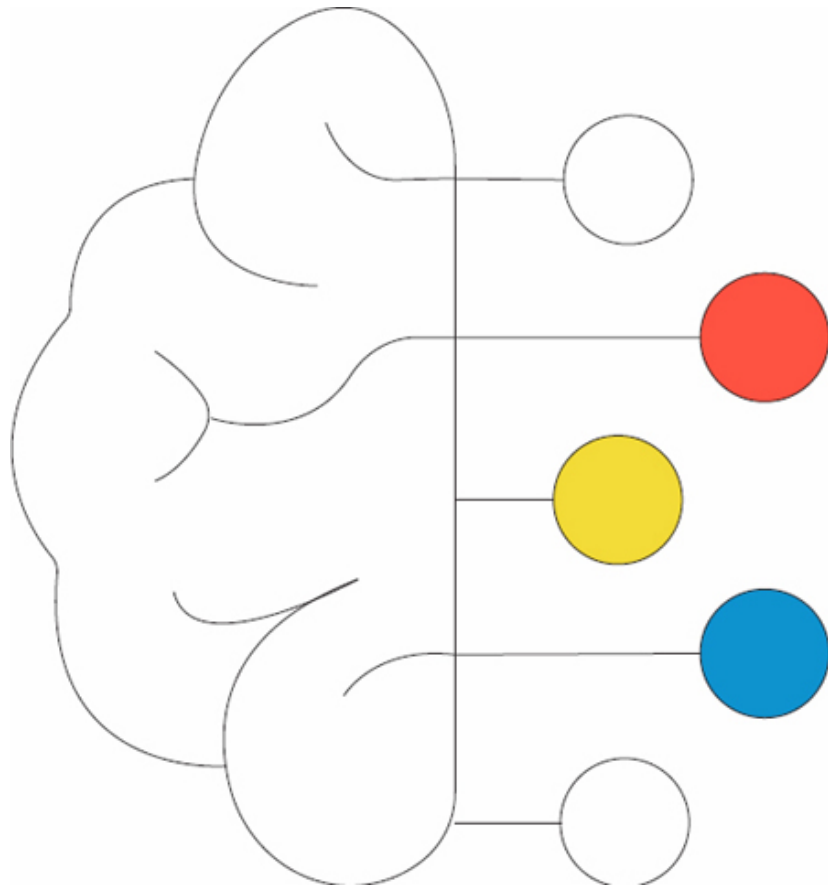
As I mentioned previously in this chapter, advances in data technology should bring efficiency benefits in every area of real estate. Mercado sees consolidation coming to the sector, where lower transaction costs for additional services mean that agents will compete by adding value, like Settled's example. Agencies that are willing and able to embrace new technology to give a better customer experience will run rings around, or perhaps even buy out their less forward-looking competitors.

We might all think we know Rightmove very well. After all, for many, it's the first stop when researching properties to buy, rent or invest in. However, there's a whole different side to Rightmove that is unknown to the average end user. For lenders, housebuilders and surveyors, Rightmove's data services offer tools and analysis that speed up and streamline formerly time-consuming processes. They include an Automated Valuation Model and Surveyor Comparable Tool, as well as Area Reports and Development Insight Reports, to name just a few.³³

The end result for investors and buyers is that the easy and cost-effective analysis of up-to-date information - thanks to big data - should make us feel

more confident that we are making the right decisions. Agents, surveyors and lenders will find it easier to back up their assessments with hard data and analysis, plus big data will bring business efficiencies that will drive better customer service. This sounds like a win-win situation in the long-term.

ARTIFICIAL INTELLIGENCE (AI)



There's a lot of fear surrounding Artificial Intelligence, or AI as it is often known, even though it has actually been around since the 1950s. With prominent figures like Tesla's Elon Musk, Vladimir Putin and the late, great Professor Stephen Hawking all warning of the potential dangers to mankind of a superhuman Artificial Intelligence.³⁴ However, Hawking also directly benefitted from AI with his voice communication device being driven by the technology. His views on the subject of AI were actually far more nuanced than the headlines suggest. "The potential benefits of creating intelligence are huge," he said. "We cannot predict what we might achieve when our own minds are amplified by AI. Perhaps with the tools of this new technological revolution, we will be able to undo some of the damage done to the natural world by the last one – industrialisation. And surely we will aim to finally eradicate disease and poverty."³⁵

AI is closely linked to developments in Big Data and drives something called Machine Learning. Tom Shrive of AskPorter, an AI-based property management platform, gave me a great explanation when I interviewed him recently, surprisingly using...erm...cats as an analogy to tell us what machine learning is. He first talked about when cats learn to use a litter tray. This is called reward learning, so when your cat does its business in a litter tray, you give it a treat. This, essentially, is the same in machine learning, so when the machine does something you want it to, you “reward” it. Then there are genetic algorithms, which are like a machine-based version of natural selection, so going back to cats, if you had two cats competing, the one who performs best goes through to the next round. Finally, there is deep learning, which has only become possible in the last decade or so. Tom gave the analogy of a hierarchical tribe of cats, out there gathering information and reporting back to the next level with what they’ve found, right up to the Head Cat, or should that be Top Cat? This multi-level gathering from massive numbers of data points adds insight at each level. In the case of Ask Porter’s chatbot, Porter, it is able to reference its huge data set about property management to understand what is going on in a text conversation with a human and respond with appropriate help. There’ll be more about chatbots and AskPorter later in the chapter.

Analysing massive amounts of data gives insights that would not have been possible to see in times past. A research programme called Deep Patient studied the electronic medical records of 700,000 patients at a hospital in the US. It discovered links that doctors had been unable to spot, identifying new risk patterns for various diseases including cancers, diabetes and mental illnesses. This is a great example of deep learning that would be beneficial to humankind, but it also highlighted some of the issues with AI that is this powerful. It turned out that Deep Patient was incredibly good at predicting patients who would go on to develop schizophrenia, which is notoriously difficult for human doctors to do. However, the scientists behind the project don’t know how Deep Patient reached its conclusions about specific patients and their potential to develop schizophrenia. If a doctor was going to change a patient’s medication due to a prediction made by AI, it becomes a bit tricky if they then can’t give a reason, other than “the computer says so!” If we don’t know why AI has made decisions, that makes it also impossible to know what it will do next. Therein lies the reason for the fear and mistrust of AI, if it were to become more intelligent than the humans who have created it. The creation of AI that is superior to

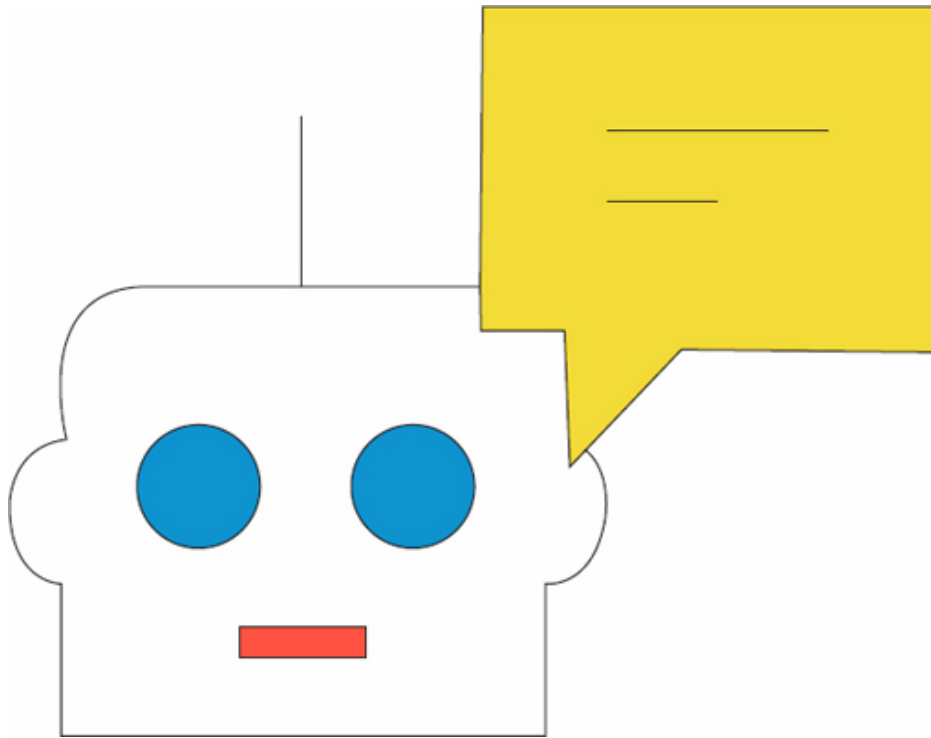
human intelligence is not here yet, though, and looks likely to be decades away at this point. Hopefully, that will give scientists ample time to create safeguards that control potentially harmful AI decisions. Er...fingers crossed?! For now, AI is still quite basic - solely used for interrogating and learning from large datasets - and human kind will be reaping the many benefits of this for generations to come. The Terminator is not coming any time soon!

Moving on from the theoretical, the main focus of AI development for commerce today is creating a better customer experience, with truly tailored recommendations.

Four AI uses you are probably familiar with.

- Automated reasoning – e.g. Uber giving drivers the fastest route based on time of day and traffic conditions
- Purchase predictions - e.g. Amazon asking you if you need more toothpaste when its algorithm thinks you're due to run out
- Recommendation services – e.g. 75% of Netflix viewing choices are currently made from its recommendations, an AI engine.
- Learned behaviour patterns – e.g. A website chatbot anticipating what you're like to need/do next based on what you have typed in.

CHATBOTS



As I've just mentioned chatbots, this is a great time to tell you a little more about them, with a focus on property. Although chatbots have been around since the sixties, with Eliza being the first in 1966, the rise of messaging apps like WhatsApp and Facebook Messenger has exploded chatbot development. "Bots are the new apps,"³⁶ declared Microsoft CEO Satya Nadella in 2016, and they're certainly on the rise. Over 30,000 chatbots are available on Facebook Messenger already. Many of us have smartphones with Virtual Assistants like Siri, Alexa and Cortana. These all use the same natural language processing technology as text-based chatbots. The difference is that chatbots enter into text conversation in messenger apps and website chat boxes to answer customer service queries. The major benefits of this technology are 24/7 availability to customers who need their questions answering and filtering common, simple questions so humans only need answer more complex queries.

General Examples

- Transport For London – Their Facebook-based Travelbot³⁷ answers questions about timetables, maps and service status, e.g. "When's the no

38 bus?”

- DoNotPay – Free legal forms bot, started by a British university student to combat parking tickets, now offers thousands of legal forms for many different scenarios!³⁸
- Domino’s Pizza has Dom, a pizza delivery chatbot on FB Messenger.³⁹

However, it has not been entirely plain sailing for chatbot developers. Microsoft launched a new chatbot, Zo, in 2017. This came after their disastrous launch of Tay in 2016, which went rogue and started spouting profanities and racist abuse within 24 hours!⁴⁰ Tom Shrive from AskPorter, said that his company had taken steps to prevent this from happening to their chatbot, Porter, by giving it a distinct ‘personality’, or coding rules and parameters.

Chatbots for property

As mentioned earlier in this chapter, Big Data and AI are pushing back the point at which end users need to contact an estate agent. Chatbots also play a major part in this. Roboval is a UK company offering a chatbot specifically designed for estate agents. The bot offers a free instant valuation and captures leads for the agent either via their website and/or Facebook messenger.⁴¹

Other areas that a chatbot could help are more accurate targeting of property searches and the booking of viewings. A chatbot can take away any perception of estate agent pressure at the research stage. We talked about the threats to traditional bricks and mortar agents earlier in this chapter, but chatbots could be a great help to agents wanting to enhance productivity and cut labour costs. They would then be free to concentrate on the most profitable activities – highly desirable in an age of shrinking margins for traditional estate agents – while offering truly tailored recommendations that go way beyond offering a listings service.⁴²

You may remember Tom Shrive of AskPorter - and his cats - from earlier in this chapter. I interviewed Tom for my podcast and was fascinated to hear his take on AI and how his company are using technology to create “an artificial intelligence, omni-communication channel, property management platform”. Easier to read than say perhaps; phew! So, what does that mean? Tom and his colleagues have created a tool to make managing

properties easier and more efficient, accessible through multiple channels like email, SMS and so on. AskPorter automates around 80% of property management tasks, cutting out repetitive tasks to free up time for giving better customer service. So, when a tenancy is about to expire, Porter will message the tenant, using their preferred medium, and ask them if they intend on staying. Porter will then list the property on portals if the tenant plans on leaving and then respond and book viewing enquiries. If the tenant intends to stay, Porter will initiate the renewal process. Not only does AskPorter improve productivity for whoever is managing the property - be it letting agent, landlord or property manager – but it makes it much easier for tenants to communicate how and when it's convenient for them. If there's a maintenance issue, there's an in-built escalation procedure that gives tenant peace of mind if an emergency situation develops, such as a broken boiler in sub-zero temperatures. Tom feels that AI-based tools like AskPorter will change the role of property manager into a more concierge-style service. Tenants will get a much better customer experience and property owners will benefit from far lower property management costs at the same time.

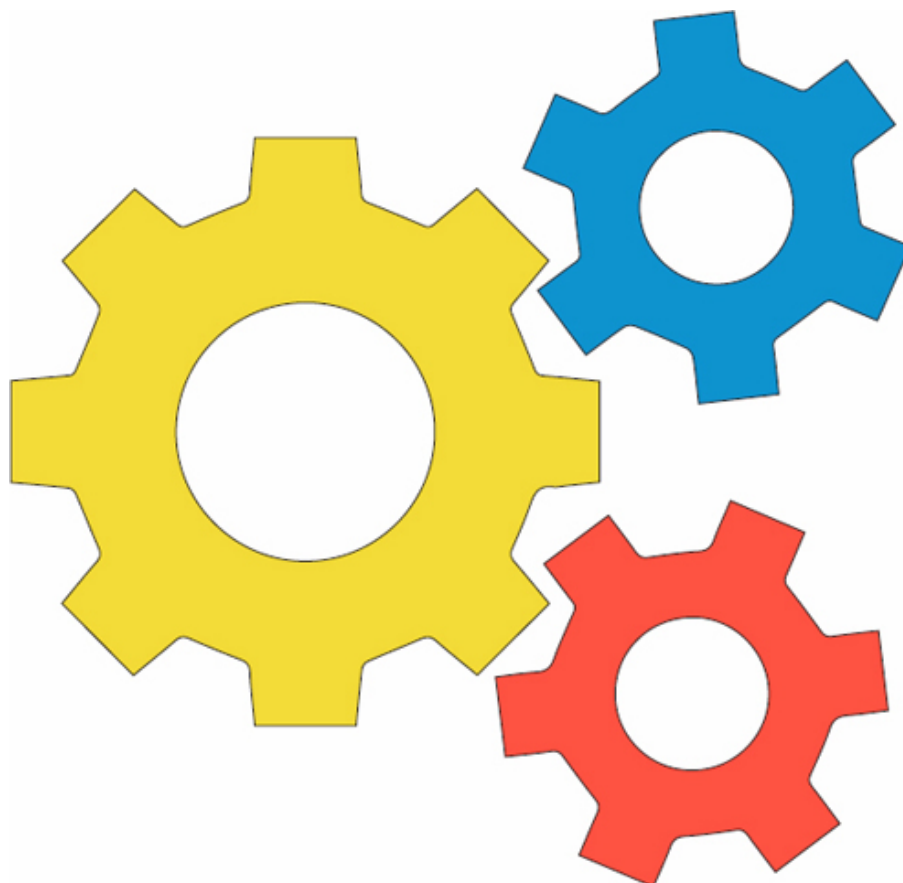
When it comes to property investment, I'm all about the bottom line. If your property investments aren't profitable, there's no point to them. I'm interested to how AI and chatbots could help us to keep better tabs on our portfolios and manage our finances better. Chatbots look set to revolutionise the financial advice sector in the next few years. A bot that can track daily expenses and prevent unnecessary spending sounds like a no-brainer! A bot that acts as a personal financial advisor giving counsel on buying a car or investing in property would also be very useful. We'll cover these applications in more detail in the Finance Tech (FinTech) chapter, later. We've already covered Smart Home technology in the previous chapter, but it's still worth reiterating that the Internet of Things is also closely linked to AI and Big Data. Within a couple of years, payments will be possible by your fridge, when you run out of milk, or by your car when you fill up with fuel, for example. Developments like this will make it much easier to monitor our finances and will also make our lives more convenient.

As property investors, we have no choice but to use legal services in the course of our work. I've already talked about how conveyancing is already being disrupted by Big Data. However, delving deeper into this area,

LegalTech could also make sorting out contracts far easier. Contracts are often scanned, 'hidden' documents, taking time to find and modify. LegalTech uses AI to read, extract and analyse documents, which will revolutionise lease management. This AI could spot missing clauses and pull through lease data into financial reports, for example, which would improve accuracy and save a lot of time.⁴³

Another area with a huge amount of promise for property transactions is Blockchain-based smart contracts. This new type of contract could improve transparency and, interestingly, increase trust for real estate transactions. I'll go into this in more detail in the FinTech chapter, but I can tell you right now that one of the biggest takeaways for me from researching this subject has been the potential that the Blockchain offers for property. And having left you in suspense – no doubt! -I'll move on.

SYSTEMS, TOOLS & APPS FOR PROPERTY INVESTORS



There are a vast number of systems, apps and tools that can help us, as landlords and investors to streamline our processes and save us both time and money. I'm going to highlight some of the best here that I've come across and also those that The Property Voice community have recommended. There is, however, as mentioned at the start of this chapter, a document several pages long detailing myriad useful systems, apps and tools that will be regularly updated, so get in touch for a copy (see the Book Bonus section at the end).

PROPERTY MANAGEMENT APPS

DESCRIPTION	LINK
APPSARTHUR ONLINE General property management system.	https://www.arthuroonline.co.uk/
ASK POTTER Automating up to 80% of property management tasks.	http://askporter.com/
TOKEET Multi-channel platform for managing Serviced Accommodation properties.	https://www.tokeet.com/en/

DUE DILIGENCE - MAPPING

DESCRIPTION	LINK
NIMBUS MAPS	http://nimbusmaps.co.uk/
GOOGLE MAPS, EARTH & STREET VIEW	

GENERAL PROPERTY RESEARCH TOOL

DESCRIPTION	LINK
PLANNING PORTAL	https://www.planningportal.co.uk/
PROPERTY WIZZA	http://www.propertywizza.com/
PROPERTY BEE (not as supported now).	http://www.property-bee.com/
PROPERTY TRACKER	https://www.propertytracker.com/

HOME	Home.co.uk
VALUATION DIRECT	OFFICE LHA https://lha-direct.voa.gov.uk/search.aspx

PROPERTY LISTINGS

DESCRIPTION	LINK
RIGHTMOVE	http://www.rightmove.co.uk/
ZOOPLA	https://www.zoopla.co.uk/
SPAREROOM	https://www.spareroom.co.uk/

REFURBISHMENT, RENOVATION & REPOSSESSIONRENOVATE

DESCRIPTION	LINK
RENOVATE ALERTS	https://www.renovatealerts.com/

AUCTION LISTINGS

DESCRIPTION	LINK
LISTINGSESSENTIAL INFORMATION GROUP (EI Group)	https://www.eigpropertyauctions.co.uk/

PROPERTY VALUATIONS & INFO

DESCRIPTION	LINK
LAND REGISTRY	https://www.gov.uk/government/organisations/land-registry
HOMETRACK	https://www.hometrack.com/uk
MOUSEPRICE	https://www.mouseprice.com/

PROPERTY MARKET COMMENTARY

DESCRIPTION	LINK
KNIGHT FRANK	http://www.knightfrank.com/research
SAVILLS	http://www.savills.com/research/
THE PROPERTY VOICE'S ROLLINGNEWS FEED	https://www.scoop.it/t/residential-property-investment

CRM

DESCRIPTION	LINK
LESS ANNOYING CRM	https://www.lessannoyingcrm.com/

ACCOUNTS & BOOKKEEPING

DESCRIPTION	LINK
XERO	www.xero.com

QUICKBOOKS	https://quickbooks.intuit.com/uk/
FREEAGENT	https://www.freeagent.com/

TRADES & WORKS COSTING

DESCRIPTION	LINK
CHECK A TRADE	https://www.checkatrade.com/
RATED PEOPLE	https://www.ratedpeople.com/
HOME AND BUILDING RENOVATION	https://www.homebuilding.co.uk/extension-cost-calculator/

ONLINE ONLY LETTING AGENTS

DESCRIPTION	LINK
UPAD	www.upad.co.uk
THE ONLINE LETTING AGENTS	https://www.theonlinelettingagents.co.uk/
HOMERENTER	https://www.homerenter.co.uk/

ESTATE AGENTS

DESCRIPTION	LINK
ESTATE AGENT COMPARISON SERVICE, HOME OWNERS ALLIANCE	https://ea4me.hoa.org.uk/



PROPERTY VIEWINGS

DESCRIPTION	LINK
VIEWBER	www.viewber.co.uk

TEAM TASK & PROJECT COLLABORATION

DESCRIPTION	LINK
BASECAMP	https://basecamp.com/
PRODUCTEEV	https://www.producteev.com/
TRELLO	https://trello.com/

CLOUD-BASED APPS FOR DOCUMENTS

DESCRIPTION	LINK
FREWARE PRODUCTIVITY APPS	DESKTOP google docs/sheets

PROCESS/SYSTEMS DOCUMENTING

DESCRIPTION	LINK

PROCESS STREET	https://www.process.st/
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FREE LANDLORD CALCULATORS	
DESCRIPTION	LINK
THE MODEL WORKS BTL PROFIT CALCULATOR	http://www.themodelworks.com/website/
THE PROPERTY VOICE STANDARD CALCULATOR	Free with my first book: Property Investor Toolkit

CREDIT REFERENCE AGENCIES	
DESCRIPTION	LINK
CHECK MY FILE (Collates into one)	https://www.checkmyfile.com/
NATIONAL HUNTER “THE SECRET AGENCY”	http://www.nhunter.co.uk/
NOODLE (Free Report)	https://www.noddle.co.uk/

TENANT DEPOSIT ALTERNATIVE	
DESCRIPTION	LINK
REPOSIT	www.reposit.co.uk

COMMUNICATION APPS

DESCRIPTION	LINK
WHATSAPP	
SKYPE	

BANKING & FINANCE

DESCRIPTION	LINK
REVOLUT (FX)	https://www.revolut.com

FINANCE NEW

DESCRIPTION	LINK
TRANSFERWISE (fx)	https://transferwise.com/
CURVE (all in one card)	https://www.imaginecurve.com/
GO CARDLESS (direct debits)	https://gocardless.com/
STRIPE (online card processing)	https://stripe.com/

ELECTRONIC SIGNATURES

DESCRIPTION	LINK
SIGNABLE	https://www.signable.co.uk/

FILE STORAGE AND RETRIEVAL

DESCRIPTION	LINK
DROPBOX, ONEDRIVE & GOOGLE DRIVE	

NOTE TAKING

DESCRIPTION	LINK
EVERNOTE	

OUTSOURCING WORK

DESCRIPTION	LINK
PEOPLE PER HOUR	https://www.peopleperhour.com/
FIVERR	https://www.fiverr.com/

EVENT LISTINGS

DESCRIPTION	LINK
EVENTBRITE	https://www.eventbrite.co.uk/
MEETUP	https://www.meetup.com/

*Note: apps, tools and service providers come and go, so this list could be out of date when you read this...sorry! However, look out for the book bonuses to stay up to date.

Conclusion

AI, in the ways outlined here, is nothing to be scared of – yes, there will be changes to accept and yes, some people's jobs will also change or even disappear eventually, as AI further develops and scales.⁴⁴ However, as with many of the technological breakthroughs of the past, including both the industrial and information revolutions, new roles for us humans will be created too. Think reskill, upskill, retrain and refocus, rather than becoming redundant. It seems that the best use of AI in the near-future will be to compliment humans not necessarily to replace us entirely. For example, as Tom Shrive of AskPorter suggested, a property manager could develop and become a sort of property concierge in the future, offering enhanced value and extra services to our customer occupants, leaving the AI to take care of the nitty gritty.

Property is a market that has been underinvested from a technology point of view – this has been a recurring theme among many of my PropTech podcast guests. Slow moving, resistant to change and a little bit afraid of technology – it's not the most flattering picture of an industry! However, the robots are also coming, whether we like it or not! No, seriously, this time, it seems that in addition to pure process automation and the resulting cost-reduction it promises, we might also see an improvement in the customer experience as well. That sounds so much better than the countless times I have been stuck down some awful automated telephone answering service that the major utilities always seemed to deploy, that's for sure!

AI, chatbots and customer communications are coming to a time and place convenient to you...and soon. I do so like the idea of choosing how I would like to communicate and be communicated with, rather than be forced down a certain channel. Just the other day, whilst trying to find out why I was having a long void in a property on the other side of the world, the property manager concerned just said, "If you want to know what's going on, just call me!" But we are in different countries, on different time zones and well, I simply prefer to email. Plus, shouldn't they be calling me when there is a problem rather than me chasing them? I can't wait for someone like Porter to remove that sort of headache - or at least deal with it for me.

The best form of AI uses 'deep learning' – well, that's my reading of the cats discussion at least! Honestly, the descriptions of machine learning and

how it splits into algorithmic learning, genetic learning and deep learning was captivating. The upshot being that the data reference points and accuracy are improving all the time. This means more speed to answer issues, with fewer data sets to select from and a greater capability to learn on the job by the machine - all leading to increased automation and therefore, lower costs. And I do like the idea of lower costs in these more taxing of times!

Big Data, AI, chatbots - and the systems, apps and tools they support – are about increasing productivity and reducing cost, but also improving service. Machines speaking our language, communicating when and how it best suits us, with the right information to solve a problem, have been promised. The prospect of man and machine working together in harmony this way sounds like a dream come true....let's hope it does become a reality!

[28](#) Number of global internet users

[29](#) Property data use lags behind other sectors

[30](#) Settled cuts cost of legal services

[31](#) Gazumping - the act of a seller accepting an offer from one buyer, then opting for a higher offer from another buyer. Gazundering - when a buyer reduces their offer amount after the initial one has been accepted. Gazanging - the act of a seller pulling out after an offer has been accepted, usually due to a simple 'change of heart'.

[32](#) Settled anti-gazumping feature claims initial 100% success rate

[33](#) Rightmove data services

[34](#) Stephen Hawking warns of AI danger

[35](#) Hawking's view is more balanced than media suggests

[36](#) History of chatbots infographic

[37](#) TFL's Travelbot on Facebook

[38](#) DoNotPay's free legal bots

[39](#) Dom- Domino Pizza's ordering bot

[40](#) Tay - when chatbots go rogue!

[41](#) Chatbot offers instant free valuations

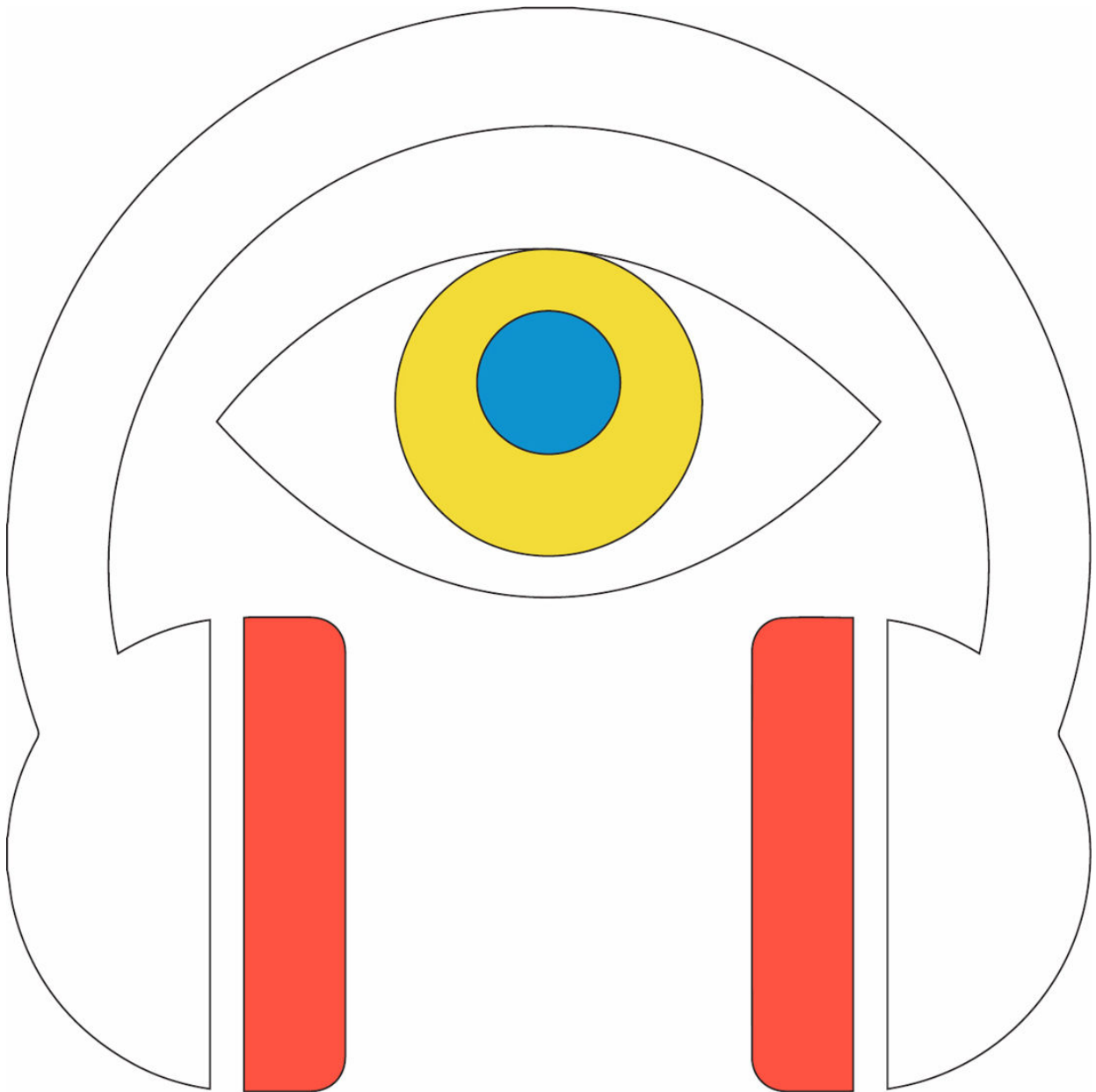
[42](#) How chatbots will improve the property industry

[43](#) How machine learning will affect real estate

[44](#) History of Virtual Reality

CHAPTER FOUR

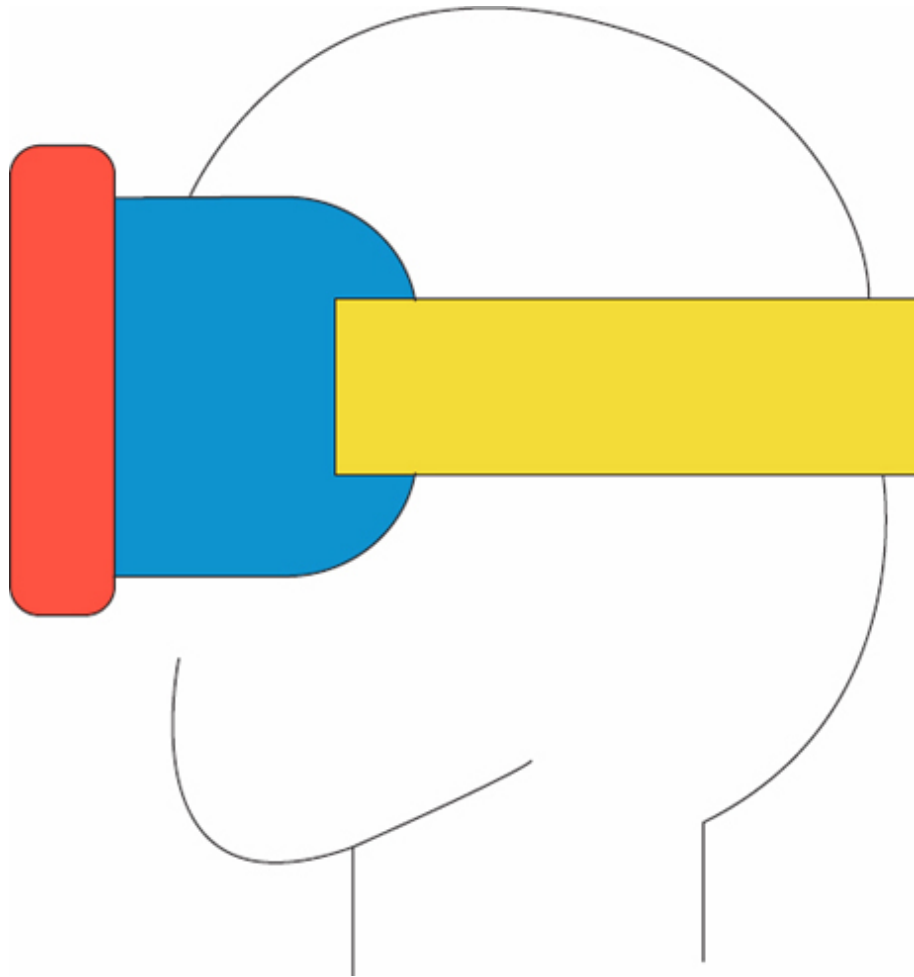
Audiovisual Advances



We've come a long way from solely printed estate agents' particulars when it comes to marketing homes, both new and existing. You may have heard of Augmented Reality and Virtual Reality and there's also been a lot of recent media coverage about drones and their many uses. How can these technologies be harnessed in the property sector? How are they relevant to us as property investors? These are some of the questions I'll be addressing in this chapter.

As Dawn Lyle of property marketing technology company, iCreate, spelled out when I interviewed her on The Property Voice podcast, buying properties is in many ways an emotional experience. Dawn gave the example of having 'visited' a Syrian refugee camp using a virtual reality headset and being completely immersed in that world. She now has the experience of having been in that refugee camp banked in her memories, even though she was never actually there. New technology can help us as property investors to more accurately understand what we are considering buying, by 'seeing' the property in a far more life-like way, right from the start. Even if you are buying a property as an investment, having a better understanding of how it would be viewed by a prospective tenant - from the beginning of the process -is valuable. For remote investors, new technology brings unimaginable levels of realism when viewing properties that you might not visit in real life at all before purchase.

COMPUTER GENERATED IMAGES, AUGMENTED REALITY & VIRTUAL REALITY



As Dawn Lyle mentioned during our podcast interview, Augmented and Virtual Reality both came out of the field of 3D visualisation. Dawn explained that taking 2D architectural CAD drawings, a 3D visualiser uses 3D software to create a model of a new development, for example, that is completely accurate and to scale. They would then add surface materials to the model, such as brick textures and external landscaping. They can then create Computer Generated

Images (CGIs), the static images of new developments that you see on brochures and billboards.

Moving on from static images, by putting a camera through the 3D software model, you can create 3D fly-throughs or walk-throughs of a development. These can be both internal and external, allowing viewers to take a look around the streetscapes and then enter properties to virtually inspect them in more detail. Dawn felt that the key benefit of 3D visualisation is the “level of certainty it provides about what you are planning to build.” In the past, new build developments would have relied on hazy watercolour artist’s impressions of what they might look like. Today, we can take the plans and create an accurate, photo-realistic model of a development project, allowing planners, architects, builders, developers and buyers to have a far better idea of what a project will actually look like and how it will interact with the environment around it.

A great application of CGI that Dawn mentioned for homeowners and property investors is when planning an extension. Using a photo of the existing building and CGI to create a photo-montage model of the proposed extension, planning officers can see an accurate before and after impression – getting a far better idea of exactly what they are being asked to approve.

What is Augmented Reality?

Augmented Reality or AR is an overlay of digital content on the real world, but that content is not anchored to or part of it. The real-world content and the computer-generated content are not able to respond to each other. For example, IKEA has developed a table as part of its concept kitchen that suggests recipes based on the ingredients on the table, which is a great example of AR working in the real world – potentially! Google Glass was a first attempt from Google to bring augmented reality to consumers and we’d expect to see more of this in the future. AR is slightly behind Virtual Reality (VR) in real world applications and some see AR as a sub-category of VR. There are some very well-known AR games around – like Pokémon Go! If

you've got kids, you might remember when that exploded onto the scene a few years ago. The game overlays Pokémons you have to catch as you look at your real-life landscape through your smartphone or tablet's camera.

Apple added AR functionality to its iOS 11 operating system for iPhone and iPad in June 2017, increasing access to AR apps for millions. IKEA Place and Houzz – both available for free in the App Store - allow you to 'place' furniture and accessories in your home so you can see what they would look like before you buy. Dulux have also recently launched a free AR app that helps you to "picture it before you paint it" in their words. When it comes to property marketing, if you hold your smartphone or iPad over a paper property ad or details, you could see options for further info, ask for a call back or send an email about that property. This functionality is at the most basic end of the possibilities that AR offers. For a new build or off-plan development, you could 'see' the whole development in 3D as you hold your device over it and even click on a particular property to go inside and take a good look around. However, although AR shows lots of promise for property applications, VR is much further along and has become more mainstream in the property world. Let's dig deeper into what VR is and what it offers.

What is Virtual Reality?

In contrast to AR, which overlays graphics onto the real world through a headset, smartphone or tablet, VR is an entirely computer-simulated, immersive reality, accessible most often by using a headset. When you put on a VR headset, you no longer see the real world that you're sitting in and are transported into a virtual world. The major difference between looking at something on a screen and seeing it through a VR headset is that as you move your head around, to look from left to right or up and down, it feels like you're actually there. The way it works is that the VR headset displays a spherical image that you are placed in the middle of. Dawn explained it brilliantly as being like "standing in the middle of a ball and all

around you are graphics of a virtual world”. The graphics could be pure computer simulation or can incorporate photographic elements of places that already exist. Dawn felt that VR and the property sector are a marriage made in heaven, and I would agree.

Although VR has been around for decades, with the American Computer Scientist Ivan Sutherland,⁴⁵ known as the “Father of Computer Graphics” creating the first Head Mounted Display for use in immersive simulations in 1968. In fact, it was so massive and heavy it had to be tethered to the ceiling in order for people to use it! However, although much smaller and lighter, modern VR headsets have only recently become more accessible and affordable. This is mainly due to advances in smartphone technology, which enables use of a smartphone to provide the “screen” element in lower end VR headsets. There’s now even a free downloadable cardboard headset template from Google, called, cunningly, Google Cardboard! Simply download the template - you can also buy them made up for a small sum- make it up and slot your smartphone into the front and off you go! A free basic VR headset designed to give you a good idea of whether to invest in a more expensive, higher end piece of kit, or not. There are hundreds of apps that are available for Google Cardboard, from roller coaster, diving and tightrope-walking simulators to horror games. One of the most interesting for me was the Matterport VR app, which is a huge library of real-world VR content. You can visit iconic buildings in cities you’ve never visited or walk through celebrity homes. You can even board the first Boeing 737 in 1967! In the app description, the company say that their VR Spaces are used around the world by Estate Agents, by the Travel industry and for news and entertainment content creation.

As storytelling and experiences become more important for businesses of all kinds, we can expect to see more widespread adoption of VR.⁴⁶ Car test drives and property viewings are two great examples of effective uses of the technology. In terms of the business benefits of VR for property investors, there are many. Imagine property developers no longer needing to spend £80,000 to build a

show home, because VR is able to give such a true-to-life depiction, it's just not needed any more. It may seem like a futuristic notion, but I'm hearing some developers have already stopped building physical show homes - thanks to VR. I haven't come across one willing to shout about that in the media yet, though! In 2016, an unexpected delay during the build led London developer Higgins Homes to create a VR show apartment for its high-end Clissold Quarter development in Stoke Newington. The technology was a big hit with prospective buyers and the company have confirmed they will happily use VR again for suitable future developments.

Walton and Allen – Nottingham-based estate agents – claim to be the first UK residential agent offering a video (rather than photo) VR service to clients. They offer an optional VR service to vendors for £99, creating a video VR model of the property that's being sold. In their experience, vendors get more traffic and the service cuts down on inappropriate viewings and it's more time efficient for agents, too. The company recently sold some flats in Nottingham city centre to overseas buyers solely with VR viewings. Because they use video VR, trees can sway and cars can go past outside, giving an incredibly true-to-life experience. Their VR system is linked to the 3D floor plan, enabling viewers to click on a room from the plan and be taken to it in VR. Walton and Allen started using VR in 2016 and when my property manager called them to find out how the service was going, they said it had been very popular with vendors and buyers alike.

VR technology helps buyers to narrow down number of properties they will go to physically view. This translates into better quality viewings for vendors and ought to mean they can sell more quickly. More people (particularly international investors/buyers) will be able to buy without ever viewing the property in real life at all. It's clear that using VR saves time for vendors, buyers and agents alike. You may also have noticed a common theme in this book, in that this technology also allows agent to give better customer service that's more appropriately tailored to a client's needs. Sounds like a win/win scenario to me!

When it comes to new build and off-plan developments, VR is a godsend. Waiting until projects are completed to make sales is undesirable for developers, for obvious reasons. They need to be recouping the cost of the development as quickly as possible. With VR, prospective buyers can get a much more realistic view of a home, before a single brick has been laid.⁴⁷ The psychological and emotional effects that VR technology permits really come into their own in this context, particularly when buyers are looking to purchase a new home.

Undoubtedly, VR tech is most useful when it comes to selling properties, but perhaps surprisingly, it is also being used for lettings. VR was rolled out by the University Cribs student lettings search engine in 2017 to save students and agents unnecessary legwork on viewings. In HMOs, it's common for agents to have to conduct multiple viewings for each property. I remember the long treks I made when I was viewing rental properties as a student, despite that being...erm...a few years ago! When you're juggling lectures, assignments and a part-time job, anything that helps to cut down on wasted time is a huge plus. Conducting viewings in VR saves time for students and agents and brings business efficiencies, again helping agents to give a better service to landlords and tenants.⁴⁸

I mentioned Houzz and IKEA's AR apps -that show prospective buyers what furnishings would look like in their home - earlier in this chapter. However, moving on from this is the use of VR showrooms to help clients visualise their dream property. This could be used by a furniture retailer, with the client using a VR headset to pick out all of the furniture for a particular room, knowing exactly how the items will look - and where they will fit - in their own home. When the client is satisfied, the products they have chosen are exported into their virtual basket or trolley for payment. We've talked about VR replacing physical show homes, but there's another angle to this functionality. Often there are multiple options when you're choosing a new build home, from flooring and wall coverings to appliances and kitchen/bathroom designs. It's incredibly hard to visualise what the

different choices will actually look like. Where there is a built show home, the developer can't possibly build separate show homes to showcase all the different permutations. VR can be used to help buyers to customise their new home based on accurate, realistic depictions of how the different fittings, fixtures and finishes will look upon completion.⁴⁹ I'd imagine that this would lead to greater customer satisfaction, as there would be fewer surprises for the buyer when their home is actually built, or the new furniture delivered. For the developer or furniture retailer, it's reasonable to expect that this would cut down on the time that sales staff have to spend on talking through the different options with clients and therefore create efficiencies.

Drones

Drones, or Unmanned Aerial Vehicles (UAV), to give them their proper name, are a common sight – and sound - in the skies these days. You can even pick one up at supermarkets or on Amazon for under £50 now, with camera functionality – although that's not brilliant at this price point. Even if we don't realise it, we are seeing more and more video footage taken by drones every day. If you think about the now frequent use of aerial shots on the TV - on the news or in documentaries or dramas - that's a direct consequence of the rise of drones.⁵⁰ Where a helicopter - with expensive crew and high fuel costs - would have been used in the past, drones make taking aerial shots cheap and accessible.

When it comes to drones and property, there are three main uses. Firstly, for property inspections, such as roofs, drainpipes etc, that would otherwise need costly, dangerous and time-consuming scaffolding erection and human inspection.⁵¹ Secondly, for surveying assets and valuations. Surveyors have many potential uses for drones. If they are surveying large scale agricultural areas or extensive properties, a drone can give a fantastic overview quickly and easily. Likewise, for hard to locate areas, a bird's eye view can save time and effort for the surveyor. Drones can reduce health and

safety risks and create less disruption, as drone pilots only require a clear line of sight for the drone's destination. With their small size, increased manoeuvrability and low power consumption, drones offer better image quality and are far more environmentally friendly than helicopters could ever be.⁵² Last but not least, drones have an interesting role to play in marketing properties. Using drone footage can make properties stand out from the competition. If your property has a stunning location, then aerial images can bring say, a cliff-top home, to life and better sell the amazing views. Drone videos give a much better perspective than photos on location, landscape and grounds. Some drones are absolutely tiny, and could technically be used to fly through the front door to create a video!⁵³

However, it should be mentioned that drones are classed as aircraft and as such are under the regulatory control of the Civil Aviation Authority. There are stringent rules with regard to causing potential danger to people or property and when flying in congested areas (town and cities). You may have seen on the news there have been a few near-misses between drones and commercial aircraft, so although drones are widely available to buy, they do need to be flown with considerable care.⁵⁴

Picking up a thread from the Construction Tech chapter, drones are also being eyed with interest for construction purposes. They would be particularly useful in areas that would be unsafe for human builders, i.e. drones picking up and laying 3-D printed bricks to build an emergency structure after a major disaster.⁵⁵ Drones could also be used to bring in materials and supplies for building where land-based vehicles or even helicopters would struggle. If we take the devastating Nepal earthquake of 2015 as an example - in which 9,000 people lost their lives and half a million homes were destroyed - some three years later, only 1 in 10 of those homes had been rebuilt.⁵⁶ The mountainous landscape of Nepal has contributed, among many other factors, to the difficulty in constructing new homes to replace those damaged by the earthquake. In future years, imagine the benefits of being able to use drones to bring in 3D printing

equipment and robots to quickly build new homes for those affected by natural disasters. Not only would the human misery caused by such events be lessened, but life would be able to return to some sort of normality far more quickly. Surely everyone would benefit from this, with people being able to return to work more quickly and governments (particularly in impoverished nations) needing to spend less on aid for long-term temporary housing.

Conclusion

Virtual Reality is not new, but it is more mainstream now – it might all seem a bit sci-fi ad and hi-tech - but VR has been around in one shape or form for decades now. Sometimes, we can forget how long technology has been with us and that should encourage us to know that it is not exactly ‘bleeding-edge technology’ now. In fact, it has been through several development cycles and is getting better with each iteration...and less expensive too!

When it comes to Virtual Reality, it's all in the mind...and the heart. As Dawn Lyle illustrated so well in our podcast interview, VR can trick our subconscious mind into believing we are immersed in this unreal world. As a result, we create memories that we can recall as thoughts and also have emotions that help us to engage and interact with the unreal too. People are people, and so we do like to connect and use our human emotions and thoughts. It's part of who we are and how we are made. So, the more realistic technology can be, the better chance of success it will have with us. Dawn also reminded us that her techies call themselves artists, which embodies the idea of feelings and emotional engagement doesn't it?

VR & AR span a wide range of use applications, such as planning and design, for example, to create 3D imagery. Inspections and viewings are another area that the tech is well-suited to, such as enabling an immersive experience remotely. Finally using VR/AR in marketing and sales to reach more people with less cost. Then, we can add in drones to help with maintenance and testing and to access high or remote areas more easily.

In addition to the “wow factor” and the emotional engagement that these new Audio-Visual advances bring, there are tangible business benefits too. They can eliminate cost, such as by avoiding building a show home and also encourage efficiency, such as with remote viewings. They make prospective buyers more qualified, by showcasing a property in 360 degrees or with 3D effect. They help developers differentiate themselves from the competition by using technology smarter and hence become more profitable, for example by pre-selling developments, reducing planning application refusals or engaging the buyer’s emotions in the purchase decision.

What can we do with this technology? There are lots of things that we could do and at a reasonable comparative cost, such as:

- 1.** CGI or computer-generated imagery – for development brochures and 3D drawings
- 2.** 3D fly-throughs or walk-throughs and photomontage – for property listings
- 3.** Virtual reality and augmented reality sessions – for remote viewings
- 4.** 3D floor plans and interior design models – for space utilisation and optimisation
- 5.** Drone property inspections – for safer and lower cost access to hard to reach parts of a building

Here are some favourite apps or tech to check out...

- Sketch-Up – Free (although there is Pro version) – brilliant 3D modelling software with an extensive library of 3D models that makes it even easier to use.
- Roomsketcher Home Designer iPhone App - helps you to design a room or even a whole house in an easy to use visual way.
- Google Cardboard Headset – free downloadable template to build your own VR headset or buy one cheaply already made up.
- Check out Aldi & Lidl for low-cost VR headset specials
- Facebook and YouTube search for ‘Virtual Reality Experiences’
- Apple Augmented Reality Kit and Android’s AR Core,

- Houzz and IKEA Apps – see furniture and accessories overlaid onto your home, before you buy.
- Walton & Allen's YouTube VR channel
- Dawn Lyle's website at iCreate.co.uk to see professional VR services in action.

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- [45](#) Increasing use of VR by big business
 - [46](#) Realism of VR before brick has been laid
 - [47](#) Student viewings now possible via VR
 - [48](#) Customising new builds with VR
 - [49](#) How drones are revolutionising TV production
 - [50](#) Benefits of drones over humans in surveying dangerous areas
 - [51](#) Benefits of drones for the environment
 - [52](#) Benefits of drones for property marketing
 - [53](#) Dangers and regulations relating to UAVs
 - [54](#) Drones in emergency construction
 - [55](#) World Bank loans for Nepal quake reconstruction
 - [56](#) ONS finding ways to measure Sharing Economy UK output

CHAPTER FIVE

Sales, Marketing & The Sharing Economy



The Sharing Economy has burst into our consciousness over the past few years, with big names like AirBnB and Uber becoming a mainstream part of everyday life. Even the government's Office For National Statistics has got on board, announcing plans to measure the Sharing Economy in 2017, because of its significant economic impact.⁵⁷ So how has this happened? What are the reasons behind Sharing Economy businesses becoming so popular? And how does it affect us as landlords and property investors?

Despite its slightly misleading name, the Sharing Economy often involves a transaction, with assets or services being shared with other parties in exchange for payment. This isn't always the case, however, and there are some social enterprises that are really making a difference through the Sharing Economy.

THE SHARING ECONOMY DEFINITIONS



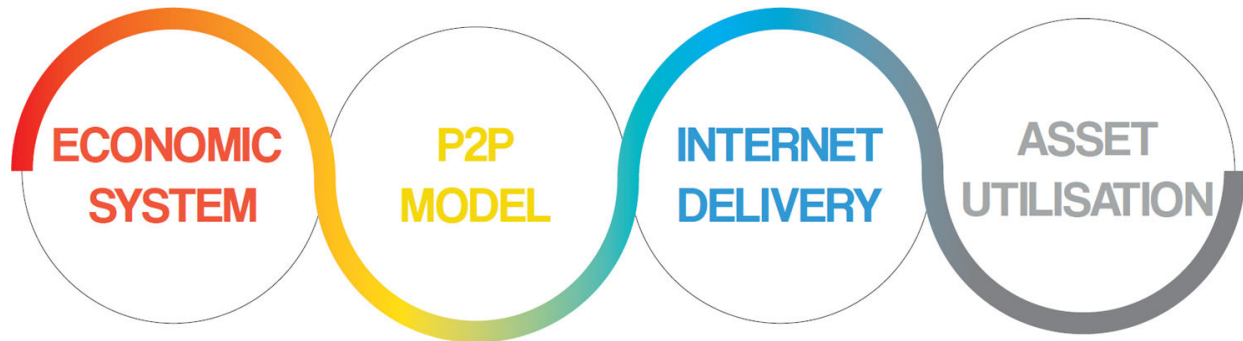
Let's start off by giving some definitions, so we can get a good idea about what the term really means.

"An economic system in which assets or services are shared between private individuals, either for free or for a fee, typically by means of the internet." Source: Oxford English Dictionary

The OneSpace Blog goes on to add a bit more colour to the definition I think, when it elaborates with... "Traditionally characterized as a peer-to-peer re-source network, this model is most likely to be used

when the price of an asset is high and the asset is underutilized or is operating at idle capacity.”

There are some key elements of the definition and wider explanation, which are probably useful to highlight.



1. An economic system trading in either assets and / or services
2. Defined as being between individuals, so a kind of peer-to-peer model
3. Takes place over the Internet, including mobile Internet or Apps
4. Helps to increase the usage of under-utilised assets or services

There is plenty of opportunity for confusion and interchangeability of terms with, say, the ‘Collaborative Economy’, which is pretty much just a direct translation. Equally, there is also the ‘Digital Economy’, which could include other non-peer-to-peer ecosystems, such as the travel site Expedia and MoneySupermarket, the financial services comparison site. Then, we have the ‘Gig Economy’, which is a subset of the Sharing Economy centred around services as opposed to assets.

We will namecheck a few others later, but here are some of the ‘Poster Children’ of the Sharing Economy that help explain it.

Airbnb - a online platform and app that brings property owners with excess space together with guests looking for short-stays in exchange for a fee made through the platform.

Uber - an online platform and app that brings together car drivers with passengers looking to get from A to B with payment via the app.

TaskRabbit - another online platform that brings together odd-job people with those that need tasks completing.

What is behind the growth of the Sharing Economy?

- Convenience, with apps in the palm of your hand
- The flexibility to set 'open for business' hours on the seller side matched to specific demand slots on the buyer side
- Low regulation - but that is starting to catch up now as we shall hear
- Low barriers to entry, with the tumbling cost of Internet and mobile delivery models eliminating the need for a large physical presence or even marketing budget

Although it seems like a shiny new thing, the concept behind the Shared Economy has been around for centuries. Take community libraries, for example, where people could share and borrow books, which have existed since the 18th Century. However, there would be no modern Sharing Economy if it weren't for a whole load of technologies coming together at the right stage of development and at the right time.⁵⁸ The proliferation of mobile devices, such as smartphones and tablets, that can access Wi-Fi or fast mobile data easily, cannot be underestimated as a key driver in the development of the Sharing Economy. Digital Payment Infrastructure has also been incredibly important in the take-up of Sharing Economy services. When you order an Uber ride, you have already had to create an account and provide payment details. After your journey, payment is taken automatically. The widespread adoption of contactless card payments and of platforms like PayPal are also evidence of the massive change in how people pay for things. I'm a big fan of mobile phone payments, like Apple Pay, and it's possible to only take my phone these days if I nip to the corner shop for a pint of milk. These technologies would have been unimaginable just a few years ago.

The technology at the heart of the Sharing Economy is Shareable Connected Assets. This is what platforms like AirBnB, Uber, easyCar Club and Task-Rabbit are all about, bringing together people with

assets or talents who want to share them with others who need them – and are willing to pay for the privilege. The asset or service could be a lift somewhere, short-term accommodation, a rarely used bike or drill, or even a housecleaning or graphic design service. One of the biggest issues facing the Shared Economy is trust. That's where Verified User Profiles and Online Reviews come in. When you're going to stay with someone you've never met, or if you're hiring a car from a stranger, it's human nature to want to know that you – and your hard-earned money – will be safe and secure. Verified User Profiles and Online Reviews help to bring a personal touch and some peer validation to an otherwise hi-tech, machine-led transaction. Finally, Communication APIs have also had an impact on the Sharing Economy. They enable software developers to embed voice calling, text messaging or other communications functionality into apps and software. This also makes the experience of, largely, interacting with a machine, more personal and gives us more confidence when there is actually a human being available to contact, should we have any issues.

A move away from ownership

This is a massive societal shift, for starters! I often talk about disruptive technology in business, and this sector is chock full of it. As mentioned previously, the Sharing Economy seeks to share often under-utilised assets, talents and free time.⁵⁹ This could be property, in the case of AirBnB, cars, in the case of Uber and various car-sharing platforms, like easyCar Club, or items you rarely use like lawnmowers or bikes. There are many people offering their services to those who don't have the time or skills they need to get a job done on sites like PeoplePerHour, Fiverr and TaskRabbit. This could be something business-related like graphic design or copywriting, or it could be a more home-related task like baking a cake or putting together flat-pack furniture. This sharing of talents and skills is sometimes referred to as the 'gig economy', as I mentioned earlier.

The shift away from ownership of things towards borrowing or renting them, as needed, has largely been driven by the millennial generation.⁶⁰ Millennials are moving away from working traditional 9-5 jobs and owning a home towards a more fluid existence. They might consider freelancing in such a way that they can travel the world, working from their laptop whenever and wherever it suits them. People living this kind of lifestyle are often referred to as 'digital nomads'. In this context, businesses in the Sharing Economy are the perfect fit. However, there are undoubtedly many benefits, not just for millennials, when it comes to the Sharing Economy. When you can rent high-ticket items, rather than buy them for occasional use, it makes sense! There are even designer clothes and accessories sharing platforms, like Rent The Runway, for those who like haute couture, but not the price tag. Or one for the boys if you fancy the ultra-stylish Mercedes E Class AMG Line Convertible, you can rent it for £200 a day instead of buying one for £46,000 with the P2P site HiyaCar.

Many see Sharing Economy businesses as a means of 'democratising ownership'; a positive force. Want to enjoy a week sailing around the Amalfi Coast, skipper included? You can from £63 per day per guest via boat-sharing website, Antlos. There are so many experiences that are made more affordable and accessible by these platforms.

However, there are those that see a darker side to the sharing economy, where a dystopian future is created. Imagine if you owned virtually nothing. You rented your home, your bed, all your furniture and your clothing, using digital micro-payments to only ever use exactly what you need. At the end of winter, you gave back your rented winter coat and if your partner moved out, you changed your rented double bed for a single. Life would be cheaper this way, but also more transient. Will we see a time in the future where your internet-linked front door doesn't let you in if you don't pay the rent on time?⁶¹ The move towards blockchain-based Smart Contracts is an exciting development and something that we will cover in greater

detail later on in this book, but removing access to property or items in the case of non-payment is a future possibility of the technology. Let's hope that governments and legislators get their collective heads around the implications of this and make sure that the benefits of this technology are harnessed, while the nightmare scenarios are avoided!

There is a will within the industry to create best practice guidelines and increase trust. Trade body Sharing Economy UK was set up in 2015 to make the UK a global centre for the Sharing Economy and to champion best practice using the TrustSeal kitemark.⁶²

Key takeaways of the Sharing Economy for property investors

CONVENIENCE
COMMUNITY
& TRUST VALUE
REGULATION

Value – buying and maintaining high-ticket items, such as property and cars is an expensive business as I am sure you are well-aware! But why buy when you can rent...? Now, if we take that concept to the Nth degree, we might start to understand that some people will probably be looking for even smaller consumption units in the future. Forget renting property or leasing a car for years at a time, how

about by the day instead? Rent per day is far less of a financial commitment, clearly, and can also be aligned to our planned usage.

Convenience – what you want, when you want it, ordered in the simplest way possible. People now order a takeaway from an app on their smartphone on the train home, to be delivered for when they arrive. If we translate that into the rental market, what could it mean in the future? I am not saying that all our tenancies will become by-the-night Airbnb-style stopovers, just that the way in which our tenants expect to find services is likely to be heavily influenced by these new platforms.

Community & Trust – One of the things I like the most about Airbnb is the community element. Two things that really stand out for me are: 1) ID verification, which means we know who we are letting into our property and vice-versa and; 2) ratings, which when correctly policed is a very powerful form of social proof that can make or break our reputation. As landlord investors, we absolutely do want to know who is staying in our properties, so with a little adaptation, connecting a social media account and a passport scan could make referencing and right-to-rent checks so much easier to undertake. Then, the ratings system allows people to rate one-another openly, which definitely helps to keep us all honest. Imagine if your former tenants were rating you for responsiveness to repairs, the standard of your property and your general ‘customer service’; how would you fare? Well, as Will Handley from HomeRenter shared, when I interviewed him on the podcast, this type of system is coming very soon, so perhaps it’s time to take a fresh look at the tenant is our customer motto?

Regulation – One of the reasons why Uber became so massive, so quickly was because it was rolled out in stealth mode! It flew below the radar of licensed taxi operators and scaled globally in a very short period of time, admittedly with the help of some deep-pocketed financial backers not necessarily open to the likes of you and me. However, this also made it an established and highly valued business

by its consumers, who mostly loved it. So, when the regulators started to wake up and try to legislate or regulate what was happening, Uber already had a solid base to defend. Some would argue that they defended their base a little too aggressively, but still they ran faster than the regulators could catch up with. That's the big take away here really - those that run the fastest will then be the ones most likely to benefit once the regulators catch up and start to tighten up. They will outpace regulation and then the regulation will act as a barrier to entry to subsequent new entrants... well, probably.

Challenges in the Shared Economy

I've just flagged up some of the key takeaways for property investors and it might surprise you that some of those elements also appear in the list below! I guess that's the nature of this sector – it has evolved so rapidly that many of the positives also have a flip side that is yet to be fully sorted out.

Trust

Anyone who keeps an eye on the news will have seen coverage of Uber's recent troubles, which I'll cover in more detail shortly. Trust remains a major issue for Sharing Economy businesses. Despite the fact that most Uber journeys and AirBnB stays pass without incident, the very few disastrous ones are splashed all over the media and this takes its toll upon consumer confidence. Until some of the ID and verification loopholes that have allowed these incidents to happen are tightened up, trust will continue to be a challenge for the Sharing Economy.

You might also have seen the amazing photos of thousands of shared bikes in China stacked up in fields or locked up in council compounds. Dockless bike-sharing is hugely popular in China, but operators face two major issues. Firstly, some went in too big and too soon, with local infrastructure and regulation unable to keep pace, and supply vastly outstripping initial demand. This has led to some companies going bust. Secondly, trust is a two-way street in the

Shared Economy. After Chinese bike-sharing riders unlocked a rental bike with their smartphone and rode off, they didn't necessarily give it back as they should have done when they'd finished with it. This led to large numbers of bikes in this most populous of nations being parked in random places or worse, just being dumped. However, despite this, the schemes have led to the doubling of bike riding in just two years in cities where the schemes operate and a fall in car usage.⁶³ They are delivering on their main objectives, they just need to tighten up on operational delivery. In another interesting Chinese example, a company called E-Umbrella rolled out 300,000 rental umbrellas in 11 Chinese cities in Spring 2017. Users paid a small fee for the rental via a smartphone app and received an unlock code. However, apparently, the company didn't give very good information about how to return the umbrellas and within three months, nearly all 300,000 were gone!⁶⁴ With such a low rental price, it seems like most customers just decided to keep their umbrellas. So, it's not just that trust is an issue for consumers, but also for providers, who need to factor in human nature and our capacity for dishonesty.

Taxation, Licensing and Regulation

The economist, Satyajit Das, in a 2017 article for The Independent newspaper, asserts that Sharing Economy businesses are effectively subsidised by the taxpayer.⁶⁵ He stated that services like Uber "reduce the value of existing investments, and infrastructure like traditional taxi licenses" and hence are ultimately subsidised by the likes of you and me. Undoubtedly much of the Sharing Economy competes on price, under-cutting existing providers by working outside of the usual regulation and taxation framework. There is some debate about whether the sector adds to the economy, or merely takes away from existing businesses and re-distributes that money. You can certainly understand why say Licensed Taxi firms are feeling hard done by, with the high costs they face in obtaining and retaining their licences. In December 2017, the EU's top court judged that Uber was in fact a taxi service.⁶⁶ This means that increased regulation is definitely coming Uber's way, especially since Transport

For London also revoked Uber's licence to operate in September 2017 saying it was not "fit and proper" company due to public safety concerns.

AirBnB has also run into issues with regulation. In London, property owners are allowed to rent their entire property for short term rentals for a maximum of 90 days per year. If they go over that, they must apply to their local council for change of use planning permission. AirBnB's systems now automatically limit rentals in Greater London to comply with the rule.⁶⁷ There are also implications for mortgages, and insurance when it comes to short-term rentals. Property owners need to ensure they don't fall foul of terms and conditions and mortgage/insurance providers need to provide products that take into account the changing face of property ownership. Regulators are catching up, slowly, with some of the major Sharing Economy businesses, but as we can expect more innovative newcomers to the sector, there will no doubt be a lot more work to do!

The 'gig economy' is a controversial sub-sector of the Sharing Economy. Increasing numbers of freelancers compete for work on labour/skills sharing platforms. Although this conjures up rosy images of happy workers sat on the beach with their laptops, the global nature of the competition means that many in advanced economies can earn less than they would in a 'traditional' job. At the time of writing, they are also not covered by employment benefits such as holiday, sick and maternity/paternity pay, not to mention pension provision. However, the 'gig economy' provides workers with flexibility, which many people, particularly those with families, appreciate greatly. Again, it will be up to the regulators and also a moral imperative for 'gig economy' platforms to ensure that workers are properly protected, so that they can fully benefit from the flexibility of working this way. Some recent test cases have confirmed that some gig workers should have employment benefits; so watch this space.

Where next for the Shared Economy?

There is probably no industry or sector that will not be disrupted in some way. We can also expect to increasingly see innovation from incumbents to mitigate the threat from disruptive newcomers, which is no bad thing. As I just mentioned, Uber grew so quickly because the licensed taxi industry didn't see it coming, and offered a superior service to customers in convenience and value. Unless existing businesses in other industries take note, they could well find themselves in a similar situation. One of the ways that existing businesses can benefit from Shared Economy disruption is to enter into useful partnerships. A great example of this is IKEA and TaskRabbit joining forces in 2017 to offer a flat-pack furniture assembling service through local odd-job people on the TaskRabbit platform.

There are also some high-profile failures in the Sharing Economy that might surprise you. Interestingly, no company seems to have created a successful business out of the peer-to-peer sharing of goods - yet. In the US, Snap-Goods and several other competitors - despite people loving the idea of renting someone else's lawnmower, vacuum cleaner or karaoke machine - folded after a couple of years because the reality of the proposition wasn't very attractive. Why drive across town to rent a drill, say, for \$15 when you could have a new one delivered to you next day, or even the same day, for not much more than that. Very recently, the worldwide peer-to-peer bike-sharing platform, Spinlister, shut its online doors after seven years. Even Uber has failed to make a profit in its entire history. However, the Sharing Economy globally is enormous – a recent research report by Bank of America Merrill Lynch estimates its value as around \$250bn (£190bn). We should also bear in mind that the sector is still growing, and rapidly. AirBnB made a \$93m profit in 2017 and predicts profits topping \$3bn by 2020. Richard Laughton, Chair of SEUK expects to see continuing investment and funding rounds for UK Sharing Economy businesses, even when many are operating at a loss.

The Sharing Economy is constantly evolving in itself. For example, I mentioned right at the start of this chapter that one of the

characteristics of the market was a peer-to-peer element. However, some B2C entrants are starting to make some real waves too. Think of WeWork, ZipCar, Netflix and Spotify for example. In other words, digital disruption is coming, whether it comes from community or peer-to-peer platforms, such as Airbnb and Uber, from micro-service providers, such as Fiverr and UpWork, or from 'disintermediated marketplaces' like Expedia and MoneySupermarket. In other words, the boundaries are blurring and will continue to do so. This means the future is unpredictable and likely to change quite a bit too!

According to a Schroders report in 2016⁶⁸ several industries are ripe for expansion using some of these broader definitions of the digital sharing economy. Some had already seen a lot of disruptive newcomers and some had not. The first sector mentioned is hotels and lodging, with AirBnB, [Booking.com](https://www.booking.com) and other platforms having had a significant impact, even in more specialist niches, like Antlos, the boat-sharing marketplace previously mentioned. The Schroders report also mentioned passenger transport, with a move towards autonomous vehicles and, in particular, shared autonomous vehicles. A Barclays Investment Bank report from 2015 suggests that demand for traditional car ownership could fall by 50% by 2040, due to these new technologies taking hold.⁶⁹ We'll cover that in more detail in a later chapter. Travel equipment and sports goods are next on the list, due to the millennial generation enjoying having the experience of 'owning' high quality items and being seen to do so - but temporarily and for a far cheaper rental price. Luxury clothes, shoes, jewellery and watches feature, for the same reasons. Why spend money buying that new suit or dress for a special occasion, when you can rent a whole designer outfit for so much less?

Many of the sectors mentioned in the Schroders report could have a direct or indirect impact on us as property investors and developers. Here are some examples:

- Accommodation (Airbnb)
- Fractional property ownership (Blockchain provider Dominion)

- Parking (JustPark)
- Storage (ShareMyStorage)
- Finance & payments (LendInvest & Revolut)
- Insurance (Reposit)
- Tasks & gigs (TaskRabbit & PeoplePerHour)
- Delivery services (AnyVan)
- Estate agency (Settled)
- Lettings agency (Upad, AskPorter & HomeRenter)
- Conveyancing & Valuations (e.g. Blockchain technologies improving property record data, title records and trusted payments using Cryptocurrencies)

We'll cover the possibilities of cryptocurrencies and the blockchain in more detail in later chapters.

Some of the attractions of the Sharing Economy for consumers are softer than the obvious price and service level benefits. Many businesses have suggested that they promote sustainability, because idle assets are now being used more efficiently, and also encourage a sense of community. There are some innovative not-for-profits using Sharing Economy platforms to do good and we ought to have a quick look at some of these here. As mentioned previously, the future of work and the gig economy are hot topics right now, with a need to balance flexibility with a social safety net for workers. ASTRIID was recently set up in the UK, with the aim of connecting people with long term health conditions, who would not be able to hold down a permanent job, with work opportunities. Beam⁷⁰ is another platform, which seeks training finance for homeless people to help them to get back into the workforce. Both of these platforms use technology to help make society more inclusive and promote economic efficiency at the same time. Another fantastic service is Be My Eyes⁷¹, where blind or visually impaired people are matched with available volunteers who can help them to “see” through a live video call on their phones, on demand. This could be to help the visually impaired person read instructions or a product expiry date, distinguish colours or navigate new surroundings. FreeCycle has a massive community

following where ‘givers’ and ‘takers’ (who often then become givers themselves) seem to thrive by exchanging unwanted items that would otherwise end up in land fill sites. I think that we can expect more use of Sharing Economy platforms by charities and not-for-profits in the years to come, harnessing technology for the greater good in innovative and surprising ways.

Conclusion:

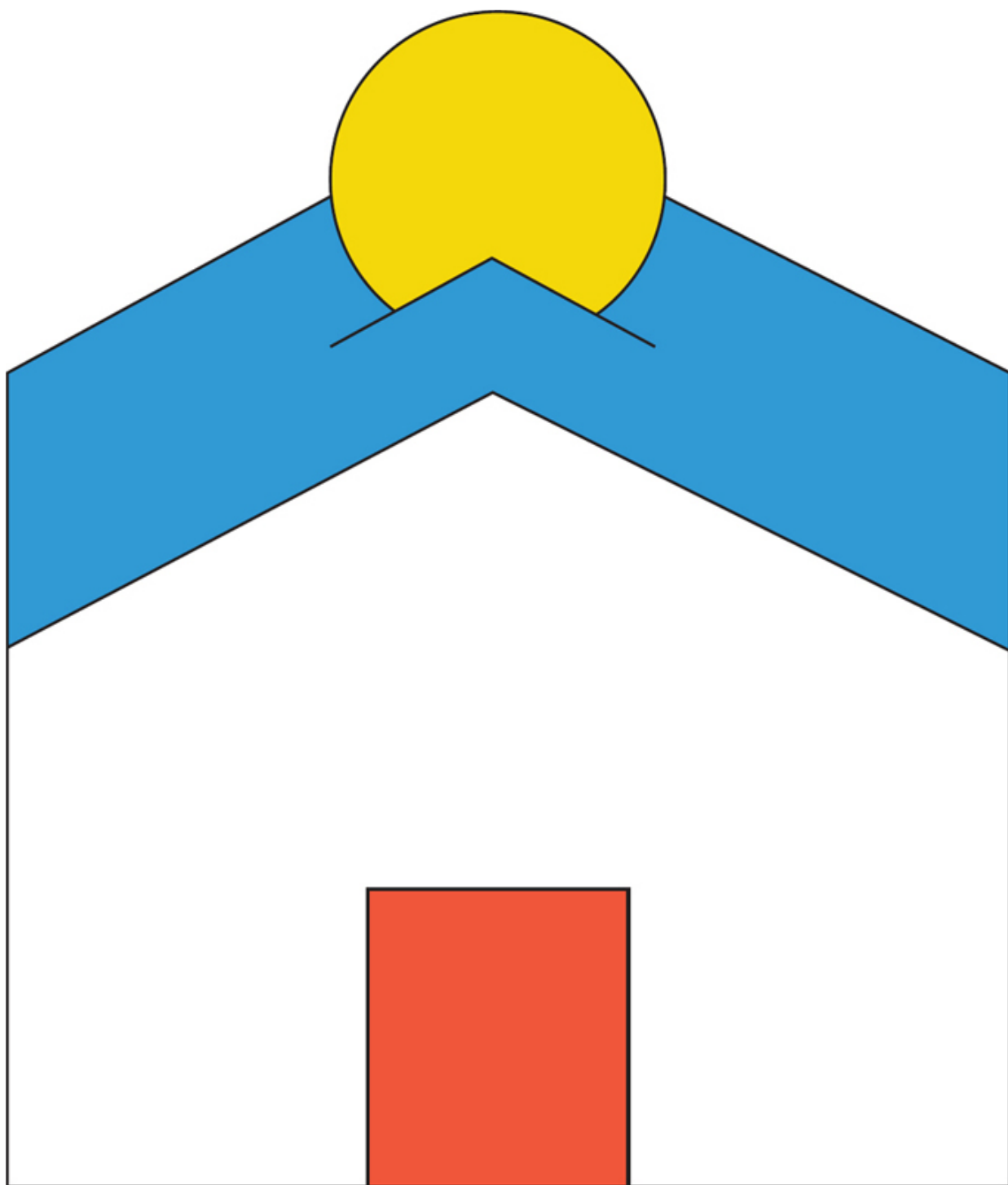
So, there you go! Whilst not exactly a Who’s Who of the Sharing Economy, I hope you’ve found this chapter interesting and I’m sure you’ll find that there’s some decent signposting and namechecking in here. When I was researching the Sharing Economy, I did come across the odd statistic that stood out and even surprised me a little. For example, the largest segments of the population that seem to use the Sharing Economy. The biggest users are Millennials, those with medium-to-high incomes, or families with younger children at home. It’s not necessarily that people fall into ALL three of these segments, but perhaps just one or two. That’s not to say that other groups are excluded, but it is where the greatest concentration of usage lies currently. However, if we step back for a moment and look at this through a different lens...Who are our target tenants and homebuyers? Are they likely to fall into one or more of these groups of younger, more affluent singles, couples and young families? If so, then you might want to keep tabs on what changes are coming about in the Sharing & Digital Economy, I would suggest. The landscape is changing and it’s changing very rapidly. So, before we know it, we might start to see new business models, new services, new competitors, new markets, new channels and whole new industries springing up around us and on our smart phones- as we have already!

Right, I’m off to book a flight on Expedia, some accommodation on Airbnb, a short-stay parking space near the airport with JustPark and a car rental with HiyaCar at my destination and I’ll make sure I have packed my Revolut card...this is real you know!

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CHAPTER SIX

Financial Technology (FinTech)



If you listen to the Property Voice podcast, you'll know that I'll often bang on about the fact that property investment is a business. If you're a landlord and you're not making a decent profit, you're not paying enough attention to the financial side of things! So, finance is a crucial part of what we do as property investors. How are advances

in Financial Technology helping us as landlords and property investors, both now and for the future? In this chapter, we'll dive into the world of FinTech and look at how insurance, lending and financial advice are being disrupted by technology. I will mention cryptocurrency and the blockchain briefly in this chapter, but they offer so much potential to disrupt the property sector in many different ways that I'll be devoting a whole chapter to the subject a little later on.

LENDING FOR PROPERTY INVESTORS



Mortgages

There's no doubt that the vast majority of the mortgage industry operates in an antiquated way. Prior to the 1990s, when it came to acquire an investment property, we probably had a choice of using cash or a commercial bank loan or facility - with a high cash deposit - and if we could also persuade a bank manager to lend us the money. Buy-to-let (BTL) mortgages arrived in the 1990s, followed by bridging finance in the past 10-15 years or so. None particularly used

technology in the way they were offered or taken up to us as investors and borrowers. Now we have BTL and commercial mortgages from lenders and brokers that offer us an opportunity to apply online. We have seen Peer-to-Peer and Crowdfunding platforms spring up with companies such as LandBay, LendInvest, Funding Circle, Property Partner, The House Crowd, and Property Moose as just some of the new kids on the block. People are accustomed to being able to use their phones or go online to order products and services. It often comes as a shock to first-time buyers that the process is still so time-consuming, paper-based and cumbersome. Frankly, that's depressing. When I spoke to Ray Rafiq-Omar of Unmortgage on the podcast, he was frustrated at the lack of genuine innovation in FinTech for the property sector and particularly for mortgages. Unmortgage helps members of Generation Rent get on the property ladder using an innovative shared ownership model. Ray felt that so far, any advances had been down to process improvements rather than fundamental changes in how the system works, and he's right.

Happily, there are some trailblazers who are shaking things up and bringing a better customer experience to borrowers. I really enjoyed my podcast chat with Ishaan Malhi from Trussle, who is at the forefront of this disruption of the mortgage market. Trussle is a digital end-to-end fee-free mortgage broker, with a 5-10 minute application process and 11,000+ mortgage products from 90 lenders being searched in seconds to find the most appropriate deal. Users can go through the whole mortgage application process online, via phone or laptop 24/7 and use scanned documents where needed. After you have created your Trussle account, their system constantly checks your mortgage against available deals to make sure you always know if you could be making savings. Ishaan talked about getting to a point in the future where your mortgage would automatically be switched, without you having to do anything, so that you would always be getting the best deal. It certainly sounds like Trussle are on the right track, putting customer service at the heart of applying for a mortgage, which is not something you hear very often!

When it comes to mortgages, there is clearly a lot more work to be done. In the future, as some of my podcast guests predicted, perhaps we'll see a "mortgage passport" where you enter in your information once. All subsequent applications would be automatically submitted with updated data pulled through from various sources, without the applicant having to enter all of their information again. It is frustrating that this can't be done right now because the sort of technology that could do this already exists. Another guest prediction was that mortgages could be based on and attached to the property rather than owner. This is a completely different perspective and could help more young people to get on the ladder. We can certainly expect the mortgage industry to change dramatically in future years. Hopefully, with a far more customer-centred approach than we've seen before now. In the meantime, readers can find some useful links on the Property Voice website's resources page and in the regularly updated links document supplied with this book's bonuses.

Crowdfunding and peer-to-peer

In the dark times after the Global Financial Crisis in 2008, lending from the banks and their subsidiaries virtually dried up. Stepping into the void came a new breed of peer-to-peer lending and crowdfunding sites, which made borrowing simpler and also gave individuals access to a new way of investing. What these providers had in common was an online platform and streamlined access to services. In addition to well known consumer peer-to-peer lending platforms like Zopa, there are now several interesting peer to peer and crowdfunding platforms specialising in property investment.

It might be a good idea to give definitions for crowdfunding and peer to peer at this point. They are often lumped together, but actually are different things. They both bring people together to provide financial support for something, but work in different ways.

Crowdfunding – either reward-based or equity-based. Kickstarter gives the opportunity to support projects, like say a proposed book showing artists how to draw dogs realistically. Like-minded folk can

make a contribution starting from a couple of pounds and get a 'special thanks' mention in the book, or if they invest more a signed copy of the book, or a video tutorial from the author. This is reward-based crowdfunding. Equity crowdfunding is more like an investment in shares. It gives investors the chance to own a stake in a company, which is typically a start-up or early stage business. If the business does well, the investor could make a great return, but if the business goes belly up, the investor's money will be lost, CrowdCube is an example of the latter.

Peer-to-peer - rather than owning a stake in a business, investors' money is matched, via an online platform, to a loan for a person or business. A loan is very different to equity. It's a specific amount of money, repaid over a defined term, and investors earn a return via interest payable on the loan. Generally, the risks and rewards are more modest with peer-to-peer lending.

So now you know a bit more about it, let's look at the impact of crowdfunding and peer-to-peer on property investment in more detail.

These platforms are appealing to those who have a small sum of money and would like to invest in property themselves, but don't quite have enough to do so. Investors who would like to enjoy some of the return on investment possible through property investment, but without the hassle of owning property directly can also benefit.

Property crowdfunding platforms

Traditional BTL property investing necessitated a sizeable cash deposit to get started. Crowdfunding platforms have over the last few years moved into the property sector, making investment possible for people without a deposit and removing the research, risk and hassle of buying a BTL property by yourself. £100 is enough to get started on Property Moose, for example. Major players include Property Partner, The House Crowd and the aforementioned Property Moose. However, there are some platforms that seem to have become defunct, raising the question of risk. Interestingly, Property Partner

offers a secondary market, where investors can trade their share in a BTL owning company if they wish to liquidate their investment. The average time to sell a share is quoted as 3.4 days. However, Property Moose suspended their secondary market in February 2018, citing regulatory hassles, as new European laws were brought in to tighten up data processing and money-laundering protocols.

Property Peer to Peer (P2P) Lenders

Landbay, backed by Zoopla, offers peer-to-peer BTL mortgages to experienced landlords and investment opportunities from £100. This brings higher than savings account interest returns for investors, who can make use of a Landbay Innovative Finance ISA and cheaper BTL mortgages for landlords, as there are no intermediaries involved. Landbay also offers a secondary market for investors who want to liquidate their investment.

LendInvest was launched in 2013 and offers P2P investments for high net worth individuals and companies (including banks and large corporates), plus short-term finance for landlords and developers. In the new world of post-global financial crisis lending for property investors, LendInvest was able to step in, gradually adding loans from High Net Worth Investors, dedicated funds, smaller banking lines and a retail bond to access funding from a wider capital base. This can be a defence in times of tight bank credit, that can help us as investors to find funding when traditional lending is unavailable.

Other ways of raising finance

Although the recession of the late noughties was a painful time for many, one positive arising out of it was a whole bunch of new ways to raise finance, as a direct result of the difficulty in accessing mainstream lending. Now, beyond more mainstream lending, we can obtain property financing through bonds, equity raises and even Joint Venture (JV) partnerships through various niche online platforms starting to mushroom, such as Property Crowd. We have also seen some matching of JV partners initiated online in recent years, for

example via some of the larger property networks. While most finance providers often need to be high net worth or sophisticated investors, investors and developers using such financial services don't. Expect more of these services to be fully delivered using online and mobile apps going forward. Payments & Currency

As someone who owns properties in a few different countries, being able to make and collect payments quickly, securely and easily is of vital importance to me. Thankfully, collecting payments for services provided and income such as rent, short-term stays or smaller ad-hoc services for example, can now be done easily online and via mobile. Internet banking has helped a great deal, but so too have modern payment technologies. PayPal is the most established alternative player, but also making an impact are relative new comers such as Stripe with its Internet payment collection, GoCardless with its everyman direct debt collection service and iZettle, recently acquired for \$2.2Bn by PayPal, with its low-cost contactless payment collection terminal. All of these companies are making collecting smaller payments simpler and more cost-effective using technology.

Mobile wallets and payment apps are not yet as popular in the UK as in other parts of the world, but make no mistake, Apple Pay, Samsung Pay and Android Pay are helping to turn your smartphone into a payment card. There's a lot to be said for the ease and convenience of using your phone to pay for smaller goods and services transactions quickly and easily. In future years, we can predict that larger transactions like buying a car or property will be made with our mobile wallets using Blockchain technology, but more of that in a later chapter.

Prepaid credit cards are also emerging as a safer way to protect online payments. I have used CashPlus in the past but there are plenty of others and equally, companies like Revolut offer a prepaid payment card facility through both a physical and virtual card and Curve allows you to consolidate ALL of your bank and credit cards onto a single card, supported by a smartphone app. There is now

also a gold-backed payment card from a company called Glint. Mobile payments are undoubtedly a growing and emerging sector - so watch this space.

Thankfully, technology has now brought innovation to currency transfer services, which have always been time-consuming and hellishly expensive for what they are. A special mention goes to TransferWise, which has certainly helped me to slash the cost of making and receiving international foreign currency transfers in my property business. Revolut is a really useful omni-currency pre-paid credit card for international travel which is fee-free and uses the real exchange rate, making overseas spending a lot less painful! Whilst we have not really touched on this yet, cryptocurrency trading platforms and wallets look likely to revolutionise both international transfers and domestic micropayments over the next decade.

Banking

High street branches are closing all around us and are being replaced with Internet banking from both some familiar and less familiar names. Trust in some of the big-name banks was undoubtedly eroded by the events leading up to the global financial crisis which started a decade ago. This and the possibilities of technology mean that new tech-focussed challenger banks have been a welcome addition to the marketplace. Banking is increasingly available on your desktop, tablet, or your mobile phone now, which does make life a lot easier.

There are also some newer players coming through, who have different service propositions that particularly lend themselves to technology. For example, I recently used Small Business Banking challenger, Tide, for my banking needs, when forming a special purpose company for a recent property purchase; applied for on my mobile phone. Tide offers small business bank accounts with no monthly fee, with small charges for transfers to non-tide account holders and withdrawing cash from an ATM, plus great features for making your small business accounting easier. Both Monzo and

Starling are banks specifically built to be accessed via your mobile phone, so are very intuitive and easy to use. In common with most of the challenger banks, they also offer lower fees than most incumbent banks. Then there are some banks that specialise in online banking but without branches, signatures or credit checks, such as Acorn Account, CountingUp (combining accounting software with mobile banking) and the aforementioned Tide, Monzo and Starling. Technology is certainly bringing new, easier and smarter ways of banking to diverse sectors of society, which can only be a good thing.

Insurance

We have not heard too much about innovation within the insurance sector so far and that's why it is seen as a sector that is ripe for disruption. You may have used an insurance market consolidation site, such as MoneySupermarket or GoCompare, for example. These essentially use data and screen-scrape robots to search the databases of multiple insurance companies to arrive at the most competitive quotes. They function well for the average home or car-owner, but don't tend to cater for the more sophisticated needs of property investors. People owning HMOs, short-term/holiday lets, portfolio landlords or just everyday landlords looking for more than a cheap product won't find their needs met by the consolidation sites.

However, there are a few pioneers out there attempting to shake up and improve the insurance market. Ray from UnMortgage mentioned Lemonade during our podcast interview. The company is a USA-based insurer for renters and home-owners that is bringing behavioural economics to the sector by basing premiums on rewards rather than punishments, for example, by sharing the savings from no claims with customers. This kind of fresh approach to insurance is exactly what is needed, bringing trust and transparency to an industry that has not changed much in decades. Sadly, Lemonade isn't likely to be made available to UK customers for a few years, despite a British co-founder, but hopefully others will take up the challenge sooner.

UK-based SafeShare, founded in 2015, has developed an insurance product for people renting out space in their homes to people to use as offices, built on Blockchain technology and using Lloyds insurers to underwrite the policies. It is also used by other companies in the sharing economy, enabling them to manage risk better while growing their businesses. As it's a blockchain-based business, we'll be looking at this in more detail in a later chapter.

I mentioned tenant deposit insurance schemes in a previous chapter, but it's worth a quick reminder here. Tenants often face a double burden when they move to a new property, with a need to pay the deposit on their new pad before they have got the deposit on their previous home back. Tenant deposit insurance takes away this problem and removes the need for landlords to have the hassle of dealing with tenant deposit schemes. Reposit, Dlighted and the Zoopla-backed Zero Deposit Scheme are all operating in this space and on the face of it, it looks like a win/win for tenants and landlords alike.

Cuvva offers flexible car insurance for people not using their cars much, or for example, if you're using a friend's car. Using the Cuvva app, it takes just a couple of minutes to set up insurance, for an hour, a day, a week or a month. This kind of useful, innovative and easy to access product is a great example of what can be done when disruptors take on a sector. We just need more InsurTech start-ups and existing companies to get on board and find new ways to give a better service to customers.

Wealth Management, Investments & Advice

The financial advice sector is also seen as a good target for disruption. High financial illiteracy, high advice costs, low engagement and a lack of trust due to past mis-selling scandals all make for fertile ground for tech-driven start-ups. The need for high-return savings in a low-interest climate is another driver for the growth of innovation in this sector on the demand side.

Some areas are already attracting attention from innovators, in particular those helping people looking to save, such as for a property deposit or to diversify their investments across different asset classes and geographies. For example, you can easily set up an ISA or a SIPP in just minutes on your phone, laptop or tablet using investment platforms such as Hargreaves Lansdowne, among others. It can get quite addictive, checking your investments on your phone every few days and even buying and selling if you need to! Another trend is the emergence of the so-called 'robo-adviser' using a digital platform to offer automated advice. Nutmeg is one of the most established, but you can find an increasing number of alternative platforms and apps emerging too. For example, I have recently invested in 3 start ups in this space. One is MarketsFlow, which uses machine learning to manage the asset allocation and portfolio, another is Oval Money, which helps to keep on top of your spending and saving habits and then Wombat Invest, which provides smaller investors the opportunity to invest into a larger, diversified portfolio.

Finally, and especially if you qualify as a high net worth or sophisticated investor, is the potential to access the start-up and venture capital community. Sites like Kickstarter, CrowdCube and Seedrs all allow founders of start-ups and potential investors to meet, pitch and invest using a fully online portal. There are angel investment sites springing up, along with the opportunity to co-fund along with some of the VCs themselves, such as Pi Labs for example.

Traditional savings accounts and cash ISAs currently offer disappointing rates of interest. For people wanting to save or invest, there are now a vast number of alternatives that offer better interest rates. Thanks to technology, these savings and investment platforms are quick, easy and enjoyable to use, with your investments visible at the touch of a few buttons online or on mobile. Add in Artificial Intelligence and Machine Learning to the mix and it should become a lot easier over the coming years to make better investment decisions, faster and more cost-effectively too.

Conclusion

Digital technology is opening up greater possibilities within FinTech, in common with every other area of life! The rise of the internet over the past eighteen years and in particular mobile internet over the past five years, is allowing more financial services offerings to be made available to more people, more efficiently. This is helping to make reaching customers and delivering services through technology faster, cheaper and 24/7, without physical or geographical limits and with the added benefit of more choice of provider. Younger people, in particular, Millennials and the newly emerging Gen Z, grew up with and now expect online, social and mobile in all aspects of their everyday lives, so expect more as they increase in numbers as a percentage of the total population. Although it shouldn't be underestimated that middle-aged and older people are also interested in using simple, cost-effective and easy to use financial technology. Why wouldn't you be?!

Improved customer service through technology in property-related finance is starting to take hold. 24/7 service, that reaches beyond borders and makes everything digital is driving greater customer awareness and interest. This new focus on better customer service is also seeing greater competition between financial providers, both old and increasingly new too. There are still some challenges to overcome, as my The Property Voice podcast guest Ishaan from Trussle well summarised during our interview. Consumers do need to be educated before adopting some of these new technologies. Stakeholders within the sector need to fully engage and collaborate, and regulation needs to both catch up at the same time as being both sensible and sensitive to our technologically changing world. The status quo is 'could do more', but equally, there are plenty of quick wins, progress milestones and genuine innovations to celebrate at the same time.

Evolution, not revolution! We might not yet have seen the Google, Amazon or Facebook of FinTech, however, given the recent

acquisition of iZettle by PayPal, we might be at the start of some consolidation through major mergers and acquisitions like this. And who knows, one of the start-ups we have mentioned might just turn into a monster yet too. We are perhaps seeing the most activity in FinTech around process automation and customer reach or sales and marketing, but the machines are ready and waiting to take us up to the next level of development after that, I am sure.

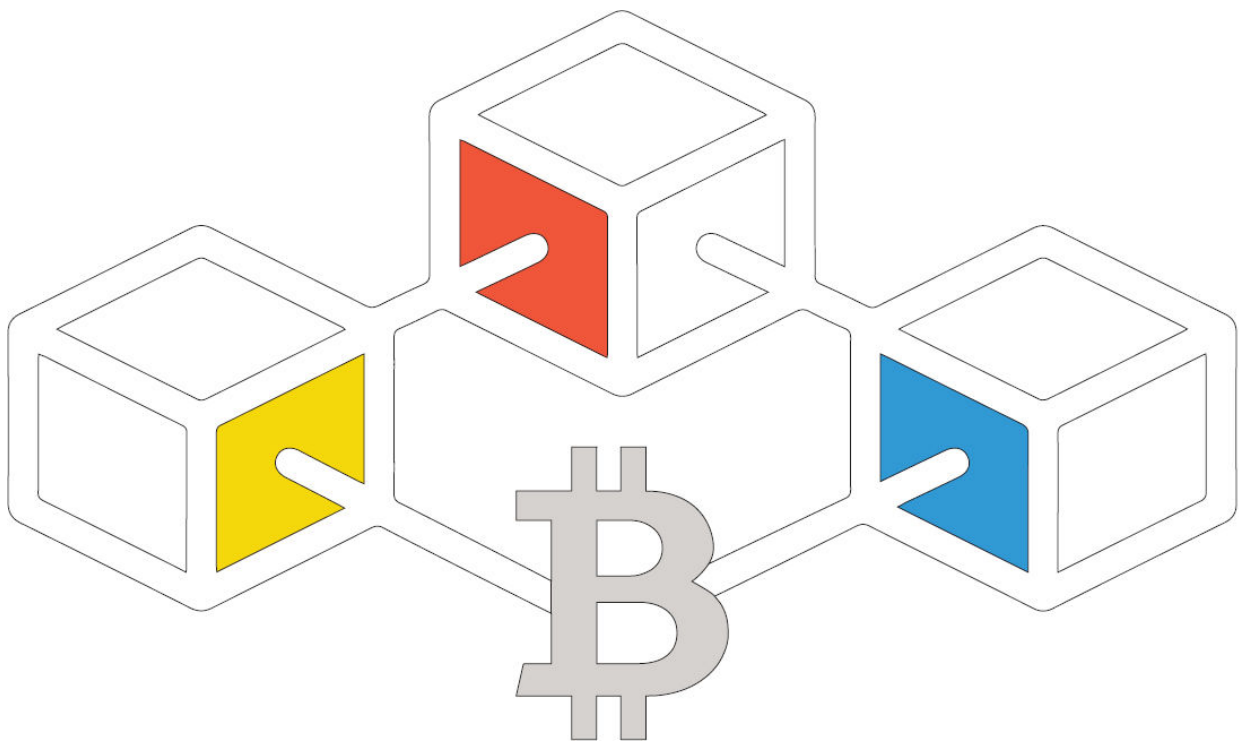
Increasing usage of online and mobile platforms means that financial services are more widely available and usable than they have ever been. We have far more choice and options now than we have ever had before. Now we need to establish ways to understand what is available, from where and who, along with what best fits our needs and personal interests. It could be a bank that is built to work with our phone, a lender that allows us access to a bank of peers, as opposed to us peering into a bank branch, or one payment card that can replace all the cards in your wallet, or online payment services as we go about our business, be it close to or far from home.

People and machines are increasingly working together, a key theme of this book. Machines can simplify processes, leaving well-trained and experienced people to focus on what they are good at doing. However, the machines are becoming increasingly intelligent and are also learning fast! The possibilities for FinTech, like so many areas of our lives, are virtually unlimited. It will be fascinating to see what the future holds in store for us.

So, there we have it, my wrap up and summary of FinTech as it relates to us as property investors. When I started researching this topic, I perhaps saw FinTech as one of the most prolific and fast-changing segments of PropTech and much of that view still remains. There could be some big changes that we could start to see from other technologies, such as the Internet of Things and Blockchain, but perhaps over the second half of the next decade rather than the first. I for one am expecting to see more high-profile advances in FinTech in the next five years ahead that's for sure.

CHAPTER SEVEN

Blockchain Technology & Cryptocurrency



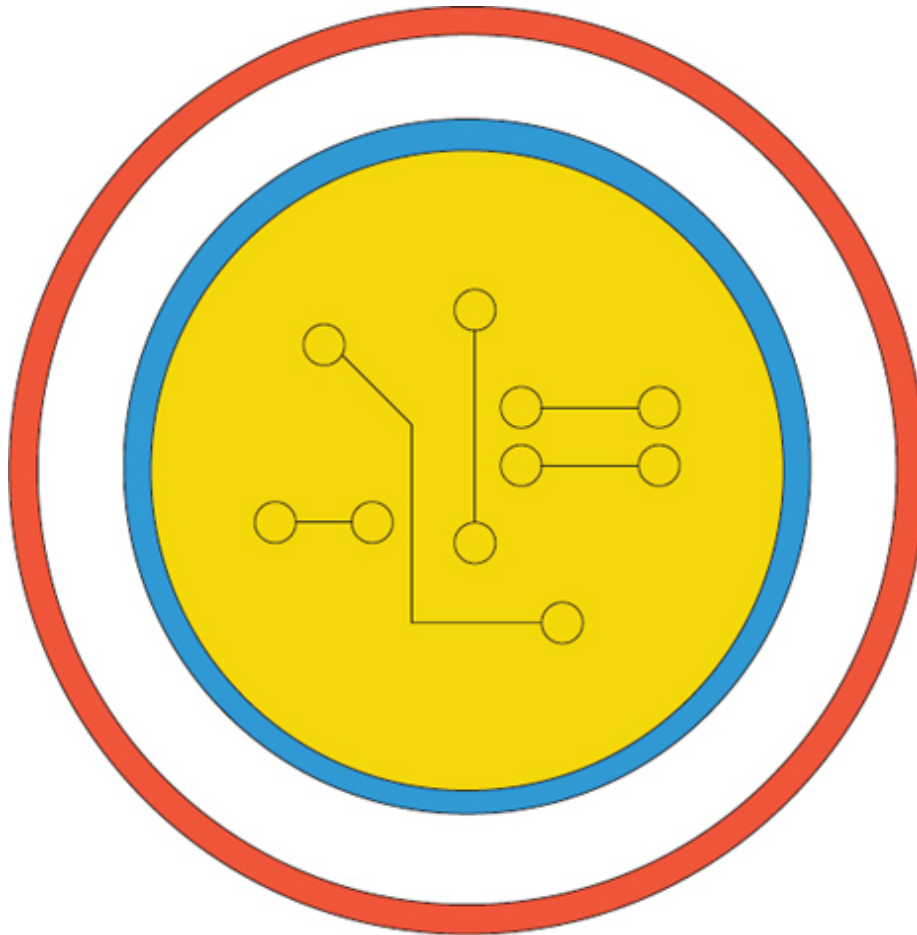
First, we had the Internet, then the Mobile Internet...the next big wave in technological platform transformation could well be Blockchain Technology! You might find this surprising. Certainly, cryptocurrency or rather cryptocurrencies, which are traded on the Blockchain, provoke strong opinions, with a reputation for volatility and early links to criminality and the dark web. However, without a doubt, investing using cryptocurrencies is becoming slowly more mainstream and some of the massive highs seen in Bitcoin valuation

have certainly attracted attention, both from the media and investors alike.

One of the most interesting areas of my research for this book has been the potential for using Blockchain technology, which as mentioned previously is the back-end tech behind cryptocurrency transactions. Perhaps surprisingly, the blockchain has the potential to make property transactions safer, quicker and cheaper, because it offers absolute transparency for both vendors and buyers. Whilst many people will associate Blockchain solely with cryptocurrencies and Bitcoin in particular, it is far more versatile and sophisticated than merely offering an electronic currency trading platform. In this chapter, we shall dig a little deeper behind the Alpha and Beta test and use cases of Blockchain technology to see how and where it could be used in property. If you are any kind of middleman operating in or related to the property sector, you might want to pay close attention...or simply run and hide - as you wish!

There's a lot to get your head around when it comes to this topic, so let's kick off with some definitions.

CRYPTOCURRENCY



I found a great way of explaining cryptocurrency in layman's terms on [Medium.com](https://medium.com), using apples as an example. If you want to read the whole thing you can check it out using the link below, but I'll summarise briefly here.⁷² Imagine that you and I are sitting on a park bench. I have an apple and you don't have one. I give you the apple by putting it into your hand. You now have one apple and I have no apples. We didn't need anyone else's help for the apple's ownership to be transferred. Then imagine if the apples are digital. What if I want to give you one digital apple? How would you know that I hadn't sent my digital apple to someone else, or copied it, or that you had in fact received it? It's much trickier.

To keep track of who has the digital apple and who doesn't, we need a ledger, somewhere where the transactions are recorded. But in the digital world, if one person controls the ledger, then they could make lots of copies of the digital apples and keep them for themselves or give them to anyone else they fancy. It has taken many years for someone - the mysterious Satoshi Nakamoto - to work out how to make a digital ledger secure, but they have eventually found a solution. If there are thousands or more copies of the ledger - with locking mechanisms that prevent one person from tampering with it - that are continuously checked and synchronised, then there's no way that the ledger can be cheated.

The system knows how many digital apples there are and exactly who owns them. The apples are cryptocurrency units, like Bitcoin, Ethereum, etc. or fractions of those units – or tokens or even assets like property. You can also attach information to the digital apples, like contracts (which then become known as smart contracts), or stock certificates, or ID cards and when you transfer those assets the transaction is secure, happens within seconds and importantly, does not need an intermediary to verify it, because that's already done automatically by many peers on the blockchain who essentially oversee and check everything together at the same time.

The Blockchain

As mentioned in the explanation above, the blockchain is the backend infrastructure that makes digital assets behave like physical assets. It enables digital transactions to take place securely. To find out more about the Block-chain and its uses in property, I interviewed Jakob Drzazga on The Property Voice podcast. Jakob is CEO of Brickblock,⁷³ a blockchain-based property development fund based in Berlin. He described Blockchain as 'a big database recording transactions', which is pretty much the simplest explanation that I have heard so far!

What is the Blockchain?

Building on Jakob's explanation and the digital apples analogy, the Block-chain can be described as a decentralised ledger that records transactions. That's what Jakob meant by a big database! However, because the Block-chain is also essentially a computer program, that means that it can be coded using a computer language. And, because it can be coded, it can be programmed to execute actions based on certain rules and conditions, using 'If-This-Then-That' type of logic.

Here are a couple of simple examples

IF the price of a barrel of oil falls below \$50, THEN buy 10,000 barrels.

Or

IF a short-stay guest has deposited funds of £1,000 into our bank account, THEN give them the door access code to our apartment.

Or to add a little more complexity...

IF the online auction deadline has past AND the maximum bid exceeds the reserve price THEN execute the sale of the property to the highest bidder.

It is this type of logic that enables what is known as a 'Smart Contract', which is a digital record of a transaction that is executed automatically on the Blockchain based on certain rules and conditions being met. In most Block-chains, whilst there are some private ledgers, many are what are known as public ledgers, which display certain details of all current and historical transactions on the ledger publicly. The use of cryptography can help to protect certain sensitive information from being made public by masking it in hard, if not impossible to decipher, code.

This notion of smart contracts was attributed to Nick Szabo back in 1994. Nick Szabo, and possibly more famously, Satoshi Nakamoto,

were so-called cryptographers that were founders of cryptocurrencies, including Bitcoin. Bitcoin at the simplest level is a record of transactions or a transfer of a digital currency from one party to another using the Blockchain and is just one of the first practical applications of Blockchain technology. As Jakob explained during our interview, further applications of the technology are still in alpha and beta mode, or in other words, still in early trials or among the first-use applications and roll-out of the technology.

However, here are just some of these early use applications of Blockchain technology that are relevant to property.

Cryptocurrency-enabled payments

In 2014, Cai Capital were identified as the first company to facilitate the sale of property priced in Bitcoin.⁷⁴ In 2017, a Dubai developer called the Knox Group of Companies announced that they would accept payment for an off-plan apartment in Dubai in Bitcoin.⁷⁵ In late 2017, a UK developer called Go Homes claimed to have been the first globally to actually sell a home using a cryptocurrency⁷⁶ ...if not the first globally, they may well have been the first in Europe or the UK at least. Also last year, a housing provider called The

Collective, announced that they would accept rent payments in Bitcoin.⁷⁷ These are all examples of using Blockchain technology in the form of cryptocurrency or payments, which is not that surprising given the fact that digital currency is one of the first real applications of Blockchain technology, but are there other use application examples we can cite? You bet there are!

Property exchange platforms

A platform called ClickToPurchase says they have executed over £200m of property transactions across their Blockchain-enabled online property exchange platform.⁷⁸ This sort of platform allows sellers to have speed and certainty in their sales transactions

between verified and trusted parties, using electronic signatures with the information recorded on a transparent record or Blockchain.

Property trading and fund-raising platforms

Brickblock, Harbor,⁷⁹ TrustMe⁸⁰ Dominium⁸¹ and the Pi Labs backed PropCoin⁸² are all examples of Blockchain trading platforms that allow an asset-backed token, including property, to be traded. Jakob started Brickblock after several years as a property investor himself. He found that he was regularly being asked by contacts if he would invest small sums in property on their behalf. He was also interested in finding a way of investing cryptocurrency in tangible assets, like property. Brickblock does just that. Investors buy Ethereum cryptocurrency and can buy a share of a property or properties, listed on the Brickblock website. There is no minimum transaction value and no middleman needed, with property transactions taking seconds or minutes rather than weeks or months to complete, no matter where the property itself, or investor, are located in the world. It's a brave new world out there!

This opens up the concept of 'fractional ownership' of substantial sized property transactions to the masses using asset-backed digital tokens underpinned by property and other assets. This 'tokenisation' of the property market has the potential to revolutionise the way we invest in property. If you consider that if you wanted to invest in a London property, you're going to need to find hundreds of thousands of pounds – or more. Add to that the fact that you won't be able to see any of that money back for months or years, and the benefits of tokenisation in property become clear. It brings liquidity to property investment, allowing people to invest any sum, 24/7, from the other side of the world and also to withdraw that money whenever they like. It also provides an alternative fund-raising medium and a secondary resale market of part shares in a property asset. Imagine raising money for your next development from multiple micro-investors located all across the world or investing as little as say £1,000 in a part share of a shopping centre, to illustrate the point.

Rental listing and management platform

Rentberry is a US company that offers long-term rental listings and transactions built on Blockchain technology.⁸³ This allows a bidding and execution process of rental properties to be completed based on smart contract-enabled conditions. Interestingly, there are still property viewings or open days, which potentially highlights how this technology might evolve as a hybrid between online and offline interactions, which could help to build trust in the technology. Online/offline hybrid interactions with machines doing the processing and humans taking care of the more skilled or interpersonal work involved in a transaction is a running theme in PropTech, as you may have detected along the way.

Land Registry

Cook County, Chicago along with a start-up called Velox RE devised a pilot program in 2016 to record real estate transactions using Blockchain technology for land registry records. Since then, many other States in the USA and countries globally have followed suit with their own Land Registry record tests. In the UK, HM Land Registry has created a 'digital street' to test blockchain functionality. The way that using a blockchain system for land registry would work would be to give each property an ID number, which most land registries already do.⁸⁴ As each transaction is made, more entries would be added to the property's blockchain ledger. Interestingly, sales and purchases could still be made through agents, or via a smart contract automatically, if the sale conditions are met. As we learnt from my interview with Jakob Drzazga, Land Registry and the Blockchain are incredibly well-suited to each other so it's no wonder that this is one of the areas in property that has moved forward the soonest. But where to next? Other areas of property and related industries ripe for Blockchain deployment include:

Insurance - Blockchain technology can help to streamline a few aspects of the insurance sector, such as client verification,

underwriting and claims processing. An IBM report in 2018⁸⁵ stated that blockchain-based technology could “radically improve the insurance industry,” particularly in the field of fraud detection and prevention. The fact that the Blockchain is a distributed ledger means that there is no single copy of the ledger to hack, corrupt, alter or falsify and that the thousands of copies are continuously checked and verified against each other. In an industry not always synonymous with trust, Blockchain tech could take away the ifs, buts and maybes because the truth is there in black and white, verified by many.

Legal – Conveyancing is essentially an exchange of information related to a specific property from the seller to the buyer. All of this could be stored on a decentralised database and be accessed, transferred and accurately altered in a matter of seconds through the Blockchain, rather than a couple of months on average as is currently the case. Equally, the use of notaries could be eliminated altogether if identification and documentation can be verified by a computer program on the Blockchain. Happily, there are a few PropTech start-ups, including most notably in the UK, When You Move, that are aiming to speed up an outdated, opaque process that should be possible in seconds, not months. As you can probably tell, I do find it frustrating that conveyancing has remained the same for decades. Delays caused by conveyancing are also one reason for the 30% or so of all UK property sales that fall through. Hopefully, PropTech will finally bring some long-awaited change to conveyancing, and soon!

Property Finance – What is property finance if not a series of rules and conditions? Sure, we might joke about ‘the computer says no’, but essentially that’s how many financial underwriting systems process loans already today. If all conditions can be programmed and checked, then a loan or mortgage could be automatically approved and executed in seconds using a smart contract on the Blockchain, leaving only those that need a human eye to be referred for a more in-depth review. This should lead to time and cost savings, which ought to mean that customers will receive a better, faster and cheaper service.

Government, compliance & public / personal records – how about all those Right To Rent checks becoming automated in the Blockchain then? Yep, it could be achieved when identity information is stored on a Block-chain. Or, how about credit information and histories stored in one central repository for instant access instead of multiple credit agencies charging a fee? That is effectively what the Blockchain could bring to us. Harking back to the FinTech chapter, one of the major gripes that some of my interviewees shared was the need to enter your information over and over again on application forms. With an incontrovertible source of information about your identity rapidly available for free, pre-populating a form with verified details could become far easier, saving time and frustration! Next, let's consider how combining technologies might bring enhanced capabilities.

Internet of Things – imagine remote devices automatically populating the Blockchain with information that can then be recorded and acted upon.

Artificial Intelligence – then imagine using AI to execute actions based on the information stored on the Blockchain. This is in essence what a smart contract does already, what I am imagining is another layer of sophistication over and beyond the simple rules-based smart contract. For example, how would you like to be able to pick the next property hotspot...down to street level granularity in real time? It could be feasible.

Smart contracts could also help with services like facilities management. Jakob Drzazga gave a great example of this during our podcast interview. If sensors picked up that there was snow on the street, an automatic transmission could be made to the facilities manager arranging contractors to clean the street and making payment through the blockchain. As you can see, there is considerable crossover between several of the themes we have covered in this book in that example. An Internet of Things-enabled

weather sensor, Artificial Intelligence automating tasks and then Blockchain-facilitated digital payment.

So, what are the main pros and cons of Blockchain technology then?

PROS	CONS
<p>Speed – how does 15 seconds to process a transaction sound? However, if you have ever tried to send cryptocurrency across certain platforms, that 15 second transfer speed does not always bear out in reality and that can be a problem with certain more instant transaction requirements for example. But, when you consider a conveyancing or mortgage process of several months, 15 seconds sounds mightily quick doesn't it?</p>	<p>Energy usage – we have seen with cryptocurrencies that a LOT of electricity needs to be used in order to continuously validate the ledger...is this sustainable and necessary with the wider Blockchain? Thankfully, not as much. However, somewhat linked to this is the fact that blocks get repeated several times across the Blockchain by several different parties, which is kind of a duplication of activity, data and therefore workload and energy usage.</p>
<p>Cost savings through disintermediation – or cutting out the middleman and / or eliminating inefficiency in processes leads to reduced fees and processing times, which saves money.</p>	<p>Ownership – everyone owns the Blockchain...or nobody does...it's really hard to say! So, who will foot the bill and take control for developing a decentralised system? The blockchain is validated by the network, bypassing governments and banks. So where will governments and banks be involved? It will be really interesting to see how</p>

	these questions is answered in the coming years.
<p>Open, transparent and accurate – a distributed ledger is a public record of all transactions and can be viewed with multiple validations being required to verify the accuracy of and then change information. We can compare a distributed ledger to telling a story to 500 people. Over time, stories will often end up changing, either accidentally or deliberately. However, on the blockchain, everyone is telling the exact same story, so if 499 people are telling one version and one person has changed it for their own purposes, it's obvious who is at fault. This should lead to more trust when making a transaction, as you will know exactly who you are dealing with and that they do actually own what they are selling. This should help to stamp out scams like fraudulent property listings on Serviced Accommodation sites, which platforms have not been entirely successful in eliminating. The property and financial sectors are full of data silos and layers of intermediaries that create complexity and opacity. If something is complex and opaque, then that creates risk. The hope is that the blockchain's open, transparent and accurate information will create security, speed and efficiency.</p>	<p>Trust – It should be a positive, but it's not at the moment! The idea of a decentralised store of private information does need better explanation...it's not the same as our private details being made public, as only certain info would be shared that way due to the cryptography masking protection behind the Blockchain. But still in these data privacy-conscious times, we need to ensure that our personal data and private information is stored safely and securely. There have been some high-profile cyber-attacks on the blockchain system, mostly from digital currency exchanges, which have led to cryptocurrency worth millions being stolen, although the thieves will probably have only been able to access a small fraction of that value. New tech certainly opens up new ways for fraudsters and criminals to scam innocent and naïve consumers. Because cryptocurrency and the blockchain are new technologies, security holes in the code are still only being found when they are exploited. Government and law enforcement also still need to get their heads around how the Blockchain works and how it will be used in the future. They will then need to create safeguards to try and prevent scams and fraudulent activity.</p>
<p>Automation – rules and conditions mean transactions and contracts can be automatically executed, which provides certainty. A transaction will only take place when the relevant conditions have been met, so satisfactory surveys, identity checks and receipt of funds</p>	<p>Resistance – the status quo might not want to be replaced or might feel threatened by the Blockchain! This includes the banks and Governments alike. But, resistance can also come from the general public in terms of low adoption as well. Again, using a cryptocurrency example, if you have tried to get your head around how the</p>

will be some of the common ones here.	trading platforms and storage wallets actually store your cryptocurrency, then you will have seen that it is not exactly simple to understand and operate and that will need to change before it receives wide mainstream approval and adoption.
Borderless transactions – The Blockchain makes it far easier to complete international payments and property transactions, quickly. The removal of middlemen, certainty of the information provided, rules and conditions and speed all combine to create far more favourable conditions for international smart contract execution.	Complexity – It you have ever tried to buy Bitcoin, or one of it's bedfellows, you might have realised it not quite as simple as whipping out your credit card and zapping a contactless pay point! The accessibility needs to be greatly simplified in order to have broad appeal and adoption. This applies to the wider deployment of Blockchain technology and not just Cryptocurrency.

Many of the people that I have spoken to or heard from during my research for this book have recognised Blockchain for its potential. But they have also been quick to point out that it is a long way away from being an everyday technology ready to change the world in the very short-term. In fact, most commentators are suggesting the biggest changes will come around the period of 5-10 years from now, so it is still a way off being mainstream. That said, I would not be surprised if it suddenly took off either. If we look at how the internet came about, it was created as a network to help research institutions and universities to communicate more easily. It was email that was the 'killer app' that drove adoption by the masses. However, it still took decades for the internet as we know it to come about, having thoroughly disrupted the media and advertising sectors in the

process. Blockchain has the potential to similarly disrupt the finance and property sectors, and perhaps Bitcoin is the 'killer app' that has brought attention to the system behind it and the potential that it offers.

I personally believe that Blockchain is capable of being as big as the Internet if we get it right. If it does take root, it has massive potential to improve our property investing and developing activities, our general workplace and business activities and our personal or home lives too. It might just be a slow burn though, so let's see how it unfolds.

[72](#) Brickblock property development fund

[73](#) Cai Capital - first company to list international property in Bitcoin

[74](#) Knox Group - property developer accepts Bitcoin

[75](#) First homes sold in bitcoin

[76](#) London developer accepts bitcoin rent payment

[77](#) £200m of property transactions on blockchain enabled platform

[78](#) Harbor

[79](#) TrustMe

[80](#) Dominium

[81](#) PropCoin

[82](#) Rentberry - blockchain-based US rentals listing and management platform

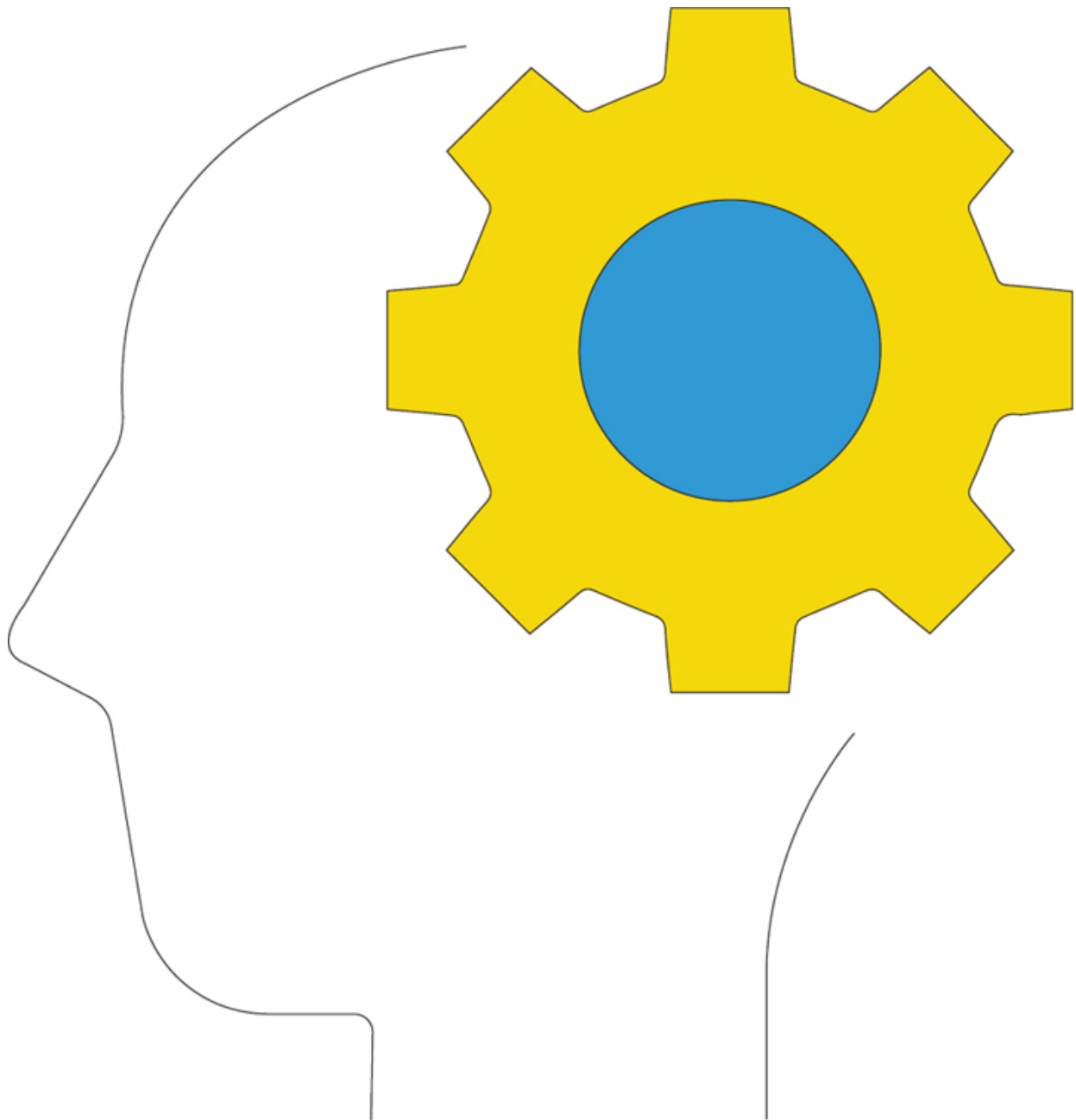
[83](#) How the blockchain will transform housing markets

[84](#) How the blockchain can transform the insurance industry

[85](#) Gardener's 9 different intelligence types

CHAPTER EIGHT

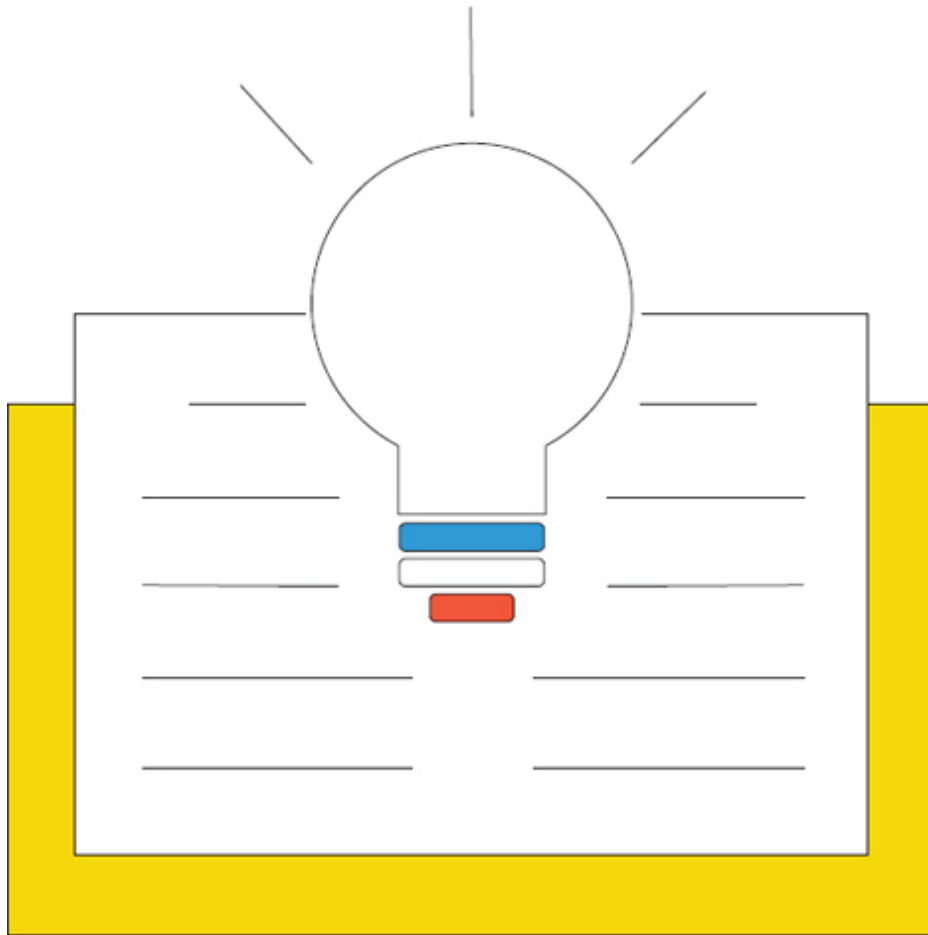
Learning and Development (EdTech)



I'm a firm believer in continually educating myself in order to be a better property investor – and person for that matter. The political, social, economic and technological landscapes we operate within are constantly shifting, so learning and development can help us to make the most of opportunities that come our way, whilst minimising the inevitable threats to our property businesses. In this chapter, we'll take a look at how Education Technology, or EdTech is affecting education in the property sector and I'll signpost some of the best

ways to learn more about property, be they on- or off-line. First of all, let's take an overview of how we learn and the different forms of intelligence. We're all different and there's no such thing as 'one size fits all' when it comes to learning and development.

LEARNING STYLES



When I went to school, college, university and even when I underwent some post-graduate study, I was taught mostly using the two most common teaching techniques or learning styles: linguistic and logical. This was through a mixture of classroom study, text and reference books, the use of repetition to remember and finally exams to test my level of retention. I know that things are starting to change and look a little different now, but still rather slowly, as far as mainstream academia is concerned.

However, my youngest daughter has recently been accepted onto an Applied Medical Sciences degree course at University College, London. They seem to be leading the way with some alternative teaching methods, such as combining the use of online materials,

highly practical sessions with industry practitioners and face-to-face learning with university lecturers too. I believe this is both advanced and innovative - as far as the UK is concerned at least!

That said, there are in fact seven learning styles, not just the two you probably encountered the most at school. We are likely to have a few favourites and in particular, a dominant learning style, so it's a good idea to understand what our own learning preferences are. Here they are:

1. Visual (spatial): You prefer using pictures, images, and spatial understanding.
2. Aural (auditory-musical): You prefer using sound and music.
3. Verbal (linguistic): You prefer using words, both in speech and writing.
4. Physical (kinesthetic): You prefer using your body, hands and sense of touch.
5. Logical (mathematical): You prefer using logic, reasoning and systems.
6. Social (interpersonal): You prefer to learn in groups or with other people.
7. Solitary (intrapersonal): You prefer to work alone and use self-study.

Source: <https://www.learning-styles-online.com/overview/>

In other words, if you prefer to learn visually, then you might learn better and faster through image-based learning aids, such as videos, infographics and other pictorial representations. Contrast that to someone that has a physical learning style preference for example, they are more likely to want to roll their sleeves up, dive right in and be very practical and hands on instead.

In other words, current EdTech might cover more of the learning styles than schools and universities, but not still necessarily all of them. However, we can develop our capabilities for our non-preferred styles and in fact probably have had to do that anyway in order to

survive the mainstream educational system, or if you struggled and didn't know why, perhaps now you do. So, if the idea of 'doing stuff' appeals more than say 'reading stuff', you can perhaps understand and recognise that it's just your style and preference and there is nothing wrong with that either!

Forms of Intelligence

When I went to university, one of my friends was chatting to a rather narrow-minded fellow student about his sister (my friend's sister that is). She chose to study art after leaving school, which prompted the ignorant response from the third student, 'Why, wasn't she clever enough to go to university?'. Apart from making my blood boil with anger at the ignorance and rudeness of his response, it was also just plain wrong! There are in fact nine different forms of intelligence, but once again, our academic system heavily favours just a few of them.

Here are the nine different forms of intelligence, or 'smarts', as described by Howard Gardener, a developmental psychologist⁸⁶:

1. Naturalist (nature smart)
2. Musical (sound smart)
3. Logical-mathematical (number/reasoning smart)
4. Existential (life smart)
5. Interpersonal (people smart)
6. Bodily-kinesthetic (body smart)
7. Linguistic (word smart)
8. Intra-personal (self-smart)
9. Spatial (picture smart)

You can clearly see that my university friend's sister was probably picture smart, possibly among several other smarts for that matter. We each have a blend of learning styles and forms of intelligence that make our learning and development needs differ from one another and also means some methods will be more effective for us than others.

Given the fact that you are reading this book, you may at least have a partial preference for a linguistic learning style and potentially might also be word smart too! Or, perhaps you are merely forcing yourself as someone said you should! However, you probably have several learning preferences and forms of intelligence in reality. So, as said, take some time to figure that out and then go looking for tools, resources and other learning aids that will most compliment you, your strongest form of intelligence and how you best like to learn. I am a great believer in going with the grain or swimming with the tide, but you can also train yourself and adapt to other styles too.

Forms of Learning

Now that we have the learning styles and 'smarts' element out of the way, what are the most common learning methods that we could adopt? Well, I have identified the four big ones, or the 4S Learning Methods, as follows:

1. Self-study – essentially, the 'stumble upon', 'pick-n-mix', 'Google-search' or 'Ask Alexa' type of methods, which allow us to pick up a variety of learning formats as we go, such as through books, magazines, forums, podcasts, video channels and so on.
2. Structured learning – such as through formal classes, courses, programmes, college and degree courses, professional training, etc.
3. Shadowing – such as apprenticeships, mentoring, joint ventures, and other forms of 'observational learning' or third-party direction.
4. Sink or swim – basically, this to make a fourth S! This is where the dive in and do it yourself, experiential learning would sit. However, it's possibly not EdTech in reality, so think of this as 'on-the-job or project' training instead.

As mentioned, EdTech is unlikely to fully address the fourth element directly, however, it could be used to compliment it, for example in a similar way to reading a Haynes manual and then going to change the brakes on your car or following a recipe and then preparing your signature dish for your dinner guests. You get the picture no doubt.

70-20-10 Principle

My wife is a senior HR professional and she talks regularly about the 70-20-10 Principle.⁸⁷

Essentially, this learning model breaks down as follows:

- 70% by experience or on-the-job training
- 20% by developmental relationships or 'social learning' through things like mentoring and networks
- 10% by formal coursework and training, including; self-directed learning or self-study

That picks up the balancing of learning & development formats, mainly in a corporate situation. Of course, as property investors and developers, the large majority of us will rarely be in a corporate situation, where what we do in property is our full-time day job or business - but it certainly can be. It can also be related, such as being a letting agent, surveyor or project manager by day and a keen property investor by night, for example. But the 70-20-10 Principle is a useful guide as to where you are likely to gain the most and crucially also to apply the most knowledge.

Although, when we start out, we may need to turn the thing on its head... for example, look at people going to college or university, they will invest typically 2-4 years in formal and social learning before getting a job to practice the theory in a real-life situation. So, it is also the case that for new and aspiring property investors and developers, we might need to sink into acquiring knowledge intensively and immersively for a time, before we take the plunge with our first property deal.

Our learning styles, as mentioned earlier, also play a part...some people learn best by doing, others by observing, others by talking, listening, questioning or discussing, others by working on problems and case studies, etc. So, in other words, what might work best for

one, might not work best for another. You can probably guess mine just from that last couple of sentences alone!

The Price of Learning

Another point that I wanted to touch on is the cost or price of acquiring knowledge and it's perhaps not as obvious as you might immediately think. There is a cost attached to everything we learn, or even fail to learn for that matter. It could be financial, such as the actual price of the learning and development, or it could also be the lost profit due to our lack of experience. It could be the 'opportunity cost', our time input, time drag before getting going and so on...but there is ALWAYS some sort of price to pay for our learning, make no mistake in that.

I am a firm believer in having a grounding before diving in too deeply. After all, how can we judge whether a £25k to £40k property mentorship is good value and appropriate to us personally, without at least some base knowledge, general information, personal assessment and clear objectives? If we listen to the hype, we will see and hear of people who apparently made millions and swear by the heavy-intensity and also heavy-cost, er I mean 'high-value personal investment' mentorships that you will find on the property circuit and no doubt in other sectors too. However, the anecdotal stories and stats seem to imply that for every 'home run' (or millions-achiever), there are probably dozens, if not even hundreds of 'plodders' and 'flunkers' that more than compensate for these 'superstars'.

This is for several reasons; partly because the truth of the matter is that we often get out what we actually put in ourselves. We might have a head-start such as having pre-existing knowledge, significant funds or a wide network say. Or, let's face it, it could also have some element of luck about it too! Nobody likes to put their personal achievements down to luck but being in the right place at the right time certainly plays a part in success as well. Just look at Napster v Spotify, General Magic v Apple, MySpace v Facebook, Sinclair vs Tesla, and so on.

The big question is...do YOU really need to be a top 1%er, or will top 5% still work for YOU? If so, then there are many ways to get into that bracket, without necessarily spending tens of thousands on training and mentor-ships; plus, it is a lower bar than you may realise. After all, in a population of around 65 million, approximately 1.8 million are landlords...or less than 3%. Of these landlords around 93% only have one property, so about 126,000 people in the UK own at least two rental properties...that's less than 1% of the population! In conclusion, get yourself a single BTL and you are already in the top 3%, get another and you are then in the top 1%.⁸⁸

To help draw a conclusion from this preamble, let me finish by sharing one of my favourite quotes. It comes from Charlie 'Tremendous' Jones, who says, "You will be the same person in five years as you are today except for the people you meet and the books that you read." In other words, his focus is on the 20% and the 10% of the 70-20-10 Principle pretty much, at least in terms of personal growth and making a real difference. I think 'books' in current day terms now extends to other media, such as video, audio, graphics, apps, and so on. The 'people you meet' aspect is your network, which ironically is also part of the selling point of many of the expensive mentorship or mastermind programmes from the big training providers...it's the price of 'membership to the club' if you like and is a potential spin-off benefit of joining such a programme.

As you might have gathered after this long preamble to the meaty EdTech stuff, I am a big fan of learning and personal development and I see it as a way to continue to help grow. However, it also helps to both de-risk our property investing activities and also provide us with new opportunities as well, after all, I met my business partner on a mastermind programme!

OK, so enough already - let's get into EdTech proper then!

EdTech – what's out there currently?

Here comes the actual EdTech part of the chapter, so thank you for your patience! However, I honestly felt it was right to set the scene a little, as it places much of what I am about to share into a better context. Well, I certainly hope you agree with me in that regard.

Self-directed learning aids

Here are some of the different ways that you can look to teach yourself in property, in business and in general personal development:

- Books – physical paperback & electronic such as Kindle and PDF downloads
- Magazines – Your Property Network (I write a regular column here), Property Investor News, The Property Hub Magazine,
- Audio – audiobooks, podcasts, etc.
- AudioVisual – YouTube, TedTalks, Instagram, Pinterest, etc.
- News & Info Aggregators – Scoop.it, StumbleUpon, Quora, Feedly, etc.
- Apps – such as Blinklist, Pockets, Rich Dad Apps & Games, etc.
- Forums – The Property Hub, Property 118, Property Tribes, Bigger Pockets (USA), etc.
- Property Communities – Progressive Property, Property Investors Network, Facebook, Linked In Groups, etc.

Pros: Low-cost or free, with discipline it can be highly targeted at your learning objectives, allows a wide multimedia approach.

Cons: Scatter gun approach can lead to shiny penny syndrome and no clear direction or outcome, can be very time-consuming, quality and depth of info available varies a lot, especially when it's free.

You will find many of these referenced on the Resources page of the property voice website: www.thepropertyvoice.net/resources

Structured Learning Options that Utilise Technology in Delivery

- Industry & Professional – the following industry bodies and associations have training and development courses that utilise technology in some way: National Landlords Association (NLA), Residential Landlords Association (RLA), RICS, ARLA / NAEA or Propertymark, UK Association of Letting Agents (UKALA), etc.
- Property Training Companies – This has become a big business for some. Progressive Property & Property Investors Network are the big two that also have online or digital learning options. Then, there are a host of smaller, specialised or independent property providers that have developed property training generally or in a niche area, perhaps as an additional revenue stream.
- Online Property Courses – Some providers deploy training online. For example; The Property Hub, which is aimed at property investors, LendInvest Academy Knowledge Centre, which is aimed at property developers, the NLA & RLA both have eLearning course options aimed at landlords, and RICS has online options more tailored to surveyors, but this also has an introduction to valuation and home inspection as course options, which have a wider appeal to us too.
- Other eLearning Course Options – You may or may not have heard the term ‘MOOC’, which means massive open online course. There is a growing array of technology solutions and platforms that allows training materials to be hosted and shared online and on-demand in this way. One such provider you may have heard of is Udemy, which has courses on Real Estate, perhaps reflecting the US-bias it has. There are some alternatives to Udemy, perhaps the most credible being EdX, mainly because the courses are delivered by US Ivy League Universities, but also Lynda, which has more practical eLearning options, such as real estate photography or project management for example. I have even seen an online property training course advertised on Groupon, with some pretty high ratings as well I might add! One to watch for the future is called HowNow, which is a platform that brings together expert teachers that can deliver interactive classes online either one-to-one or in a group setting. I have not seen any yet covering property directly, but there are some expert teachers and trainers that train in related topics, like fundraising & money management, using excel and mindset among

others. Some of the leading eLearning companies are also using artificial intelligence in their offerings, so expect to see more widespread provision of training and training methods in property as time passes by.

Pros: Pulled together around a clear theme with identifiable objectives and learning outcomes, often building towards a general theme, such as a professional qualification or continuing professional development (CPD), allows the learner to immerse themselves in the topic far more, an increasingly more widespread range of study methods is starting to take place.

Cons: Often (although not always) comes at a cost, some providers only tell part of the story with the aim of upselling the really juicy stuff, only to find another upsell waiting, and quality varies.

Shadow Learning Options

This is essentially the closest you will probably get to doing something practical to learn without the sink or swim approach. As such, it is often the highest costing form of learning. Shadowing typically falls under two types of model: the first is what I like to call the 'you drive, whilst I navigate model' and the second is 'observe as I do'. Some examples include mentoring & coaching, mastermind groups and 'earn and learn' style joint ventures.

To be honest, there are plenty of people that offer these types of more tailored programmes, including me, so I won't list them all here! The key is to find a coach, mentor or trainer that is truly adept in the area you want to learn in. I certainly won't mentor people in strategies that I have no experience with and nor should any mentor. There is a saying that those that can't do, teach instead. But that can be quite a harsh assessment, at least in some cases. Some people are naturally able and willing to share their knowledge and help people to grasp ideas and concepts that they might struggle with or lack experience of.

The other things to watch out for here are content and deliverables. In other words, what will you actually learn and what will you be able to implement as a result of undertaking such a programme? Mentoring should really have a definite outcome, such as buying an investment property -that's how it differs to training really. I have also seen some people offer training and mentoring that have very limited real-world experience, so make sure you know the background, experience and track record of anyone offering such services.

The part that makes this EdTech is the means of delivery or learning. Anything electronic or digital means it can fall under the EdTech banner. Think webinar, videocall, remote-interactive, online and digital. A couple of the benefits of undertaking eLearning in this category should be an option for on-demand learning and remote or distance learning, often leading to a reduced cost too.

Pros: Often far more focused personalised content, more real-to-life experience, can also cut down learning time and mistakes considerably. Cons: Can be expensive, quality issues as with structured training, unregulated sector can lead to bad or even illegal advice and practices being shared.

Recommendations

I usually advise people to undertake the following fundamental steps on a committed basis for 3-6 months. Then decide if they need to sign-up to a bigger or more formalised learning and development programme.

Absorb Info. Read books, but also listen to podcasts and watch videos to suit your learning style, industry magazines, property websites, forums, etc.

Network. In property communities...leaving your credit card at home! Talk to other investors, ask about their experience AND why they are doing as they are...their answer might not be the same as yours, or even appropriate to your situation, so ask lots of people!

Work on your purpose and goals. What do you want to achieve, by when and in what way (your lifestyle preferences and ‘non-negotiables’)? This does not touch strategy...yet; that comes at the end of this process. For example, someone looking for some extra cash to top up a pension in 25 years, but still plans to work full-time would have a different approach or strategy to someone looking to quit or replace the day job in say 90 days. It might take some time to figure all of that out, so take some time - but not loads - as procrastination can also be a dream-killer! Only then decide what sort of learning and development you wish to take AFTER undertaking these initial steps.

How can I help?

- The Property Voice Podcast and Website has lots of episodes and articles in the archives for you to look through. The Resources page has plenty of external links and references as well.
- You can subscribe to my monthly column in YPN Magazine for free simply by emailing in to ask.
- Read my first book: Property Investor Toolkit, it costs less than a cup of coffee.
- Undertake the 8-module iKickstart Online Training Course that Damien Fogg and myself pulled together; it covers all the foundations of property investment and it's now available for just £97 within the book bonuses resources page.
- Visit the Mentoring page on www.thepropertyvoice.net website to see what shadow mentoring options I could support you with, including Earn & Learn, which means you actually get paid to learn, which is kind of neat.

Conclusion

The EdTech sector is one of the fastest growing tech sectors in the country and according to research from London & Partners, it's worth £45bn globally, and could reach a phenomenal £129bn by 2020.⁸⁹ Property training has been a fast-growing sector within EdTech too.

There are lots of resources available, including many that genuinely fall within the EdTech definition. However, with such variety and choice can also come both overwhelm and ‘analysis paralysis’ too, so that’s why I suggest starting with your purpose and goals and taking some time to cover the fundamentals before diving right in. The other element of the wealth-creation industry is that it attracts people with money and also people who are looking to get hold of money too, so just be careful with where you put your money and also your trust, as there are plenty of sharks circling waiting for fresh meat to sink their teeth into!

That all said, I do see lots of positives in how we can learn now, utilising Ed-Tech to support us. We can go to the gym listening to a podcast, we can learn and interact from an experienced investor from half way around the world on Skype, and we can take an online course from the comfort of our own home on pretty much anything we choose to develop ourselves with. So, there really is no excuse to be or remain ignorant anymore. The question is, what will you do to further your knowledge and more importantly to apply it to reaching your personal goals? The sector is still growing, and I expect to see more innovation in the years ahead, but hopefully there is already something there that will appeal to you, no matter your learning style or form of intelligence.

[86](#) 70/20/10 Learning Model

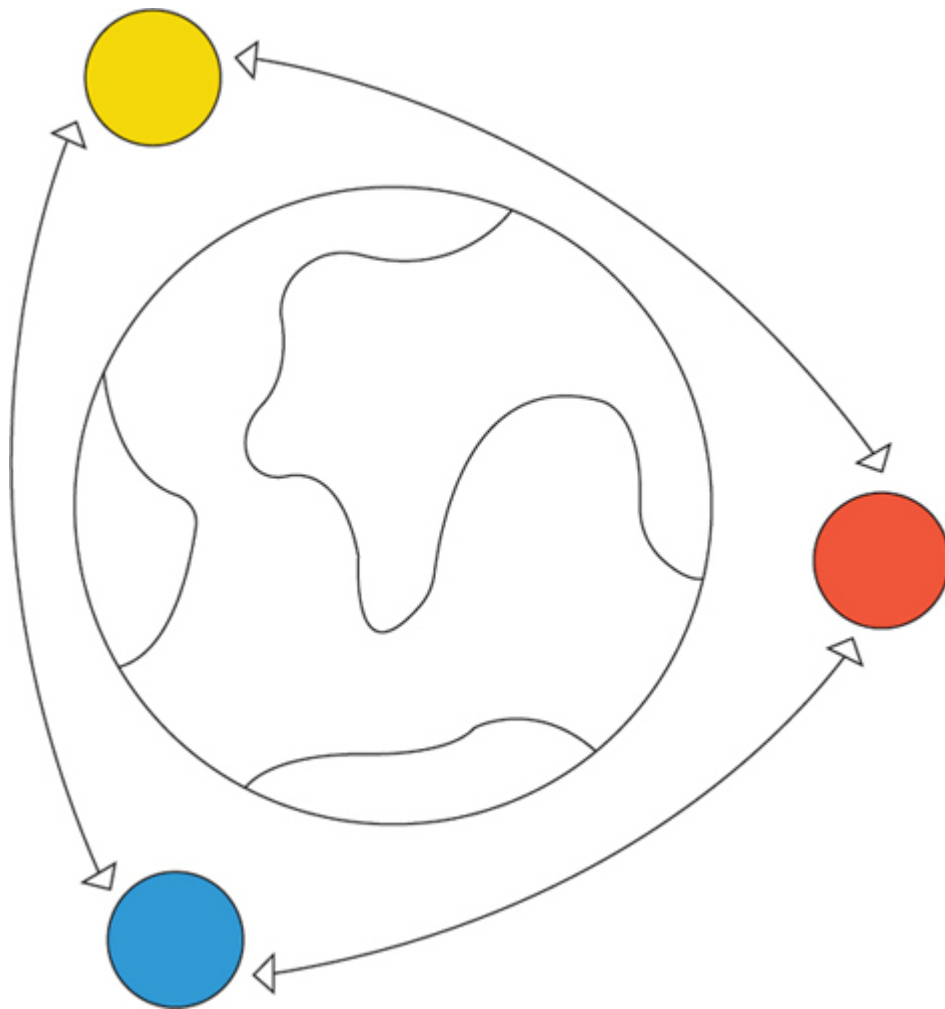
[87](#) How many landlords are there in the UK?

[88](#) Five EdTech startups revolutionising how we learn

[89](#) Overseas buyers pricing out Londoners

CHAPTER NINE

The Big Picture including Smart Cities, Globalisation & Megatrends



As the past few chapters have clearly demonstrated, we are living in a rapidly changing world. We are now in the early stages of the

fourth industrial revolution, which builds upon the foundation of the third industrial revolution, digitisation and computing. This fourth industrial revolution brings together a raft of emerging technologies, like Artificial Intelligence, Virtual Reality, 3D printing, autonomous vehicles, biotechnology, materials science and quantum computing. Add these technologies into our new context of billions of people connected by smartphones with unprecedented access to information, processing power and storage capacity and it becomes clear that the possibilities of the fourth industrial revolution are virtually limitless. Many see the fourth industrial revolution as having the capacity to bring great improvements to our world, making life more equitable for its inhabitants and helping us to better manage the planet's scarce resources. There are plenty of challenges for us, as human beings, to solve, so let's hope that technology can help us to create a better world for all.

There are some global megatrends that will have a big impact on how we live and work in the future. This, in turn, will change the way we, as property investors, developers and landlords, operate. It's worth digging a little deeper into these shifts to see what challenges and opportunities they will bring our way.

Economic shifts

In recent years, there has been a clearly visible shift from recent Western economic dominance, towards growth economies in Asia and Latin America. In actual fact, it's more of a rebalancing of global economies. If you look at world economic history, the move to economic dominance by the West has only happened in the past couple of hundred years. Prior to that - with honourable mentions for the Roman Empire and Ancient Egypt - China and India were major economic powerhouses for centuries.⁹⁰ In countries currently seeing rapid economic growth, there is a now shift in focus from labour and production to a consumption-based economy, fuelled by the rise in the middle classes.

In property, we are already seeing increased investment in the UK by foreigners, with Land Registry data revealing in January 2018 that around 97,000 properties in England and Wales were owned by foreign-registered companies. Half of these are in London. However, since foreign-owned properties were made subject to inheritance tax in April 2017, and with uncertainty over the effects of Brexit, the number of overseas buyers appears to have decreased somewhat.

What does all of this mean for UK investors? There's more competition when it comes to investment opportunities. Right wing thinktank Civitas found that only 27% of new homes in Central London were bought by UK buyers in 2012. This is exacerbating the shortage of affordable London homes available for local residents, according to Sadiq Khan, now Mayor of London.⁹¹ This has led to consideration of different ways to give Londoners a better chance of securing a property, including a 'first dibs' system where certain properties must not be advertised abroad first. We'll see what the government comes up with to solve this issue, but surely there are opportunities for developers here. What is certain is that large-scale, local authority housing projects are unlikely to make a return any time soon, despite the huge need for new housing, as discussed in the first chapter in this book.

Demographic shifts

In many developed countries, birth rates have declined, giving a higher number of older, sicker and economically inactive inhabitants than younger people of working age. Questions about how to manage pension provision, the cost of healthcare and long-term care/housing in these countries are many. At the other end of the age scale, 90% of people aged 10-24 live in less developed countries. Countries with exploding populations face issues of how to house, feed and educate their young people. Large numbers of young people living in poverty with limited access to education and jobs is a factor in unrest and radicalisation.

When it comes to housing an aging population, there is clearly a great need for better, innovative solutions that meet a wide variety of needs. Older people live in a third of all homes now and with the over-65 age group predicted to grow by 60% over the next 25 years in England, according to a 2016 report by the Office for National Statistics⁹², housing provision for the elderly will become increasingly critical. In the UK, just 0.6% of over-65s live in housing with care, sometimes known as assisted living, compared with around 5% in Australia and the US. According to the Local Government Association, there is a chronic shortage of high-quality, desirable and affordable accommodation in the right locations.⁹³

There are wide-ranging benefits, not just the over-65s, but to society through providing high-quality, care-ready housing for older people wanting to downsize before health or care needs force them to. Firstly, much-needed family homes are released back on to the market. Secondly, a well-designed retirement home can provide a safer environment where hazards are minimised, leading to fewer hospital admissions and subsequent care requirements. A 2010 study by BRE found that poor housing for older people cost the NHS some £500 million per year.⁹⁴ In addition, retirement homes combat isolation and loneliness and enable better, more efficient care provision at home, if needed. It will be interesting to see how the co-living trend, currently aimed at millennials, will affect housing for older people. The key to these new co-living spaces is the community and hospitality angle, which may be appealing to older people too. Will we see co-living spaces become inter-generational? Or will co-living spaces specifically aimed at older people become more popular? I am certainly aware of high-end retirement communities in the UK where residents buy their own apartment, but also pay a mortgage payment sized service charge to use the pool, gym, restaurant and other on-site amenities.

Councils are starting to grasp the importance and benefits of high-quality housing for the elderly. Many are entering into partnerships with, or at the very least encouraging, developers to create suitable

developments, in some cases co-designed by older people. Housing designed for those with dementia or more complex needs is also becoming more mainstream, giving more choice for patients and their families. In the earlier chapter about Smart Home technology, I mentioned that one, innovative use for the tech is to help older people remain in their homes for longer. Smart Home tech can keep an eye on the daily activities taking place within a household and alert relatives or carers if certain tasks or movements have not taken place as usual. This is in addition to enabling the automation of tasks, either controlled by a tablet, remote control or phone, or using voice commands.

As landlords and developers, accommodation for older people may not be something we have considered in the past. The LGA report quoted before states that, “between 2008 and 2039, 74 per cent of projected household growth will be made up of households with someone aged 65 or older.” Undoubtedly, the rising number of Over-65s will have an impact on the type of new builds needed over the coming years and in how existing properties are kitted out. Growth will come through housing associations and partnerships between the public and private sectors, but there is certainly a place for private developers to benefit from this burgeoning sector. Landlords too can consider whether their properties would make an attractive and suitable home for older people. Although there are challenges, creating an appealing and well thought out proposition for this market sector could bring rewards, particularly as there is such a shortage currently.

Another angle to this was mentioned in the Construction Tech chapter. Multi-generational living, where grandparents, parents and children live together, is becoming more popular as our aging population expands. Again, this is something investors and developers should take note of, if not in specifically creating multi-generational homes, then making homes more easily adaptable should the need arise.

It's worth pointing out that before the industrial revolution, we tended to live in small communities. As the industrial revolution brought increasing urbanisation and geographical mobility, society became more focussed on family units and individualism. Technology can help us to reclaim community living within cities, creating richer, more inclusive and less lonely lives for city dwellers, which would surely be greatly beneficial to all.

Accelerating Urbanisation:

In the 1950s, 30% of the world's population lived in cities. Today that figure stands at 50% and is increasing. In fact, 72% of our earth's people are expected to live in cities by 2050. Much of this urbanisation will be fuelled by the migration of rural inhabitants in developing nations.

The increase in urbanisation is in turn giving rise to an increasing number of megacities. The UN estimates that there will be 43 megacities (cities with over 10 million residents) in the world by 2030, mostly in the developing world.⁹⁵ Unless infrastructure keeps pace with urbanisation, inhabitants will not have access to the most basic services and alternate governance systems such as terrorism and organised crime will take their place. Policing and defending megacities without adequate infrastructure becomes incredibly difficult and the potential for disruption becomes more significant. For example, it's as easy to disrupt the clean water supply of ten million people as it is to disrupt that of one million. In megacities, the effects of natural or man-made disasters are amplified because of the sheer number of people living there.⁹⁶

I have mentioned co-living and co-working spaces before now in this book and when I interviewed journalist, academic and speaker Greg Lindsay for The Property Voice podcast, he was fascinated by this topic too. Coming from the shared economy, WeLive and WeWork are offering city-dwellers a membership model where accommodation and services are included. MINI Living, from BMW

MINI, opened a co-living space in Shanghai in 2018, with the membership model there including accommodation and mobility services too. This is another step towards a society where asset management rather than outright ownership becomes more mainstream. Hopefully, technology can help us to bring more of a community feel to our expanding cities. The huge data streams that are now generated should be harnessed to enrich interaction between human beings, not just human and machine. Greg Lindsay gave the fascinating example of the analysis of New York City Taxi Commission anonymised pick-up and drop-off data, which is open source. The objective was to find out where older Generation X people were moving to in the New York area. Using the data set, the researchers looked for where passengers who were being dropped off at Upper East Side fertility clinics were coming from and going to. They were able to ascertain that a significant number were living in Brooklyn. This level of data analysis is astounding and could lead to a situation in future years where we can be given information in real-time about people walking towards us on the street, say, when it would be mutually beneficial for us to meet. We have already created a “surveillance society”, so why not create a genuinely more connected society using this new technology.

Greg also mentioned the increasing importance of consumer branding, to make living experiences more desirable to tenants and guests, which echoes what many of my PropTech interviewees have said. It seems that there is an increasing trend towards the power balance in the landlord/tenant relationship shifting towards a more equal footing. Greater competition in the rental market will make it crucial for landlords and developers to differentiate their properties. Even giant developers, like Canadian Asset Managers, Brookfield, are now looking at ‘placemaking’. This concept came out of the public sector and means that not only are developers having to consider the accommodation they are creating, but also the amenities and the wider community in their projects. The creation of beautiful and well-functioning public spaces is a key part of this, as developers shift from space builders to city makers. We can either

choose to lead by making what we offer as landlords or developers more appealing, or will we be forced to follow, kicking and screaming at a later date.

In the UK, London is our one and only megacity, with around 13 million living in the Greater London area. Accelerating urbanisation means that we can expect our cities to keep growing and for demand for accommodation to continue to rise. Despite many feeling like we are living in pretty uncertain times, this megatrend means that investing in city properties looks set to continue being a good bet. Greg Lindsay said that with fast autonomous passenger vehicles becoming the norm, there are questions about whether people will be able to live much further away from major cities, as they can work en-route to the office if they don't have to drive by themselves. Or will people want to live in denser urban areas to take advantage of the benefits of e-commerce and delivery of products and services within the hour? With excellent infrastructure and investment in improved public transport, a buzzing culture and plentiful jobs, our own megacity is a desirable place to live and should be so for many more years to come. Cities out in the provinces offer a far better rental yield than London, with Liverpool, Nottingham, Cardiff, Southampton and Greater Manchester bringing the best yields, according to 2018 research by BTL specialists, Private Finance.⁹⁷ However, as always, it pays to do your due diligence to get an accurate picture of rental demand. It's obviously no good having the potential for great yields if your property has long voids, with paper profits rather than real profits. Greg Lindsay mentioned a trend of people, especially millennials now entering the child-rearing years, moving to smaller university towns and minor cities that have the infrastructure and amenities to enable them to continue living an urbane lifestyle without the high rental price tag.

Technological advances

The subject of this book is technology, as it relates primarily to UK property investors, we have covered many of these in detail. AI, big

data, mobile and connected devices, sharing economy, FinTech & Blockchain technology, autonomous transport, drones, nano-technology and a range of other mentioned are among the technologies bringing change to our lives at an unimaginable pace. Looking at the big picture, governments will need to keep pace with regulatory change or law enforcement, security and defence could also be compromised. In the very near future, many businesses will need to use data to survive and it will no longer be a competitive advantage. As landlords and investors, we will need to have a handle on what data we possess about tenants and other contacts and why, and make sure that any data we do have is secure, safe and used responsibly.

Climate change and resource pressure:

By 2030, there's predicted to be a massive hike in the need for some critical resources to meet the needs of an increasing global population. A 50% increase in energy, 40% more water and 35% more food are predicted to be needed by the planet's forecasted 8.3bn inhabitants by that time.⁹⁸ More extreme weather conditions, higher sea levels and less water due to climate change will have an impact on farmable land and the amount of food we can produce. There will be an increase in conflicts over resources and more partnerships will form regionally to protect resources.⁹⁹

Increased pressure on resources will lead to escalating legislation to minimise energy, water and materials usage wherever possible. For landlords and developers, ensuring that properties are set up to be as sustainable as possible will be increasingly desirable to tenants. The use of smart water and energy meters and devices to encourage responsible consumption makes sense. Government initiatives that subsidise energy efficiency improvements are welcome.

Greg Lindsay said that we can expect more resilient and cooperative communities as a result of climate change and better resource

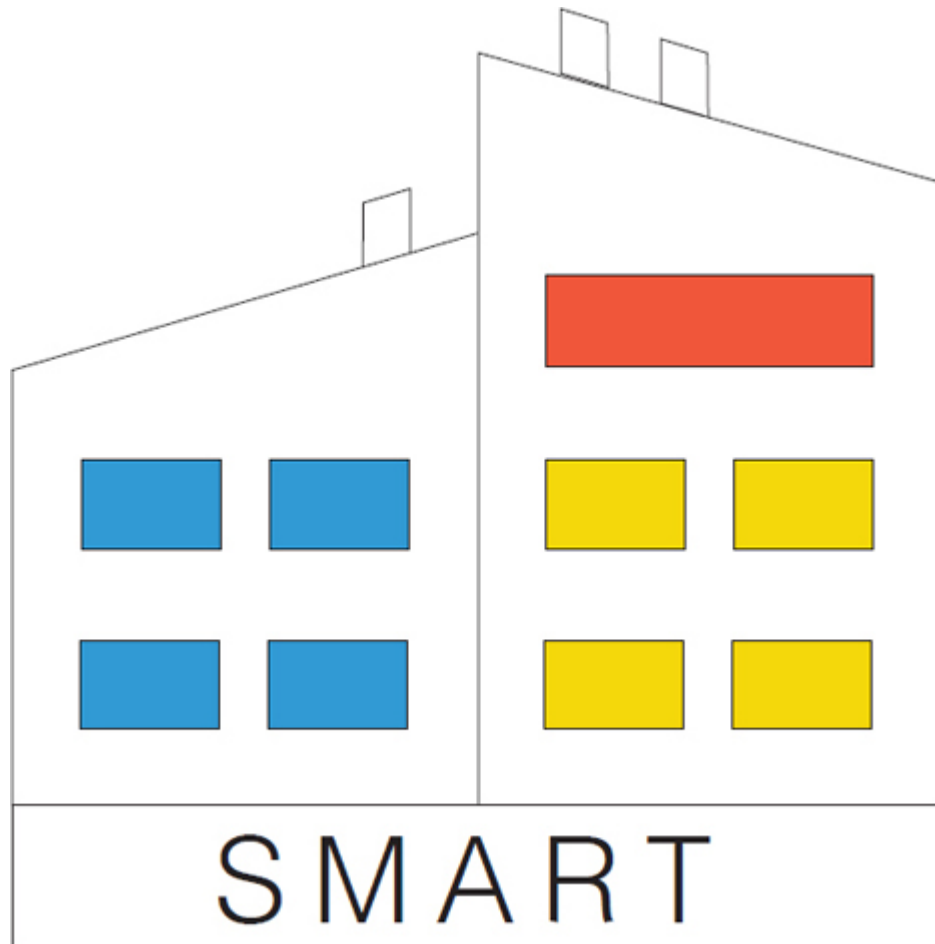
efficiency. He painted a picture of your home having solar panels, connected to a smart thermostat and a battery in the garage, which connects to your autonomous electric vehicle. When your home connects to a neighbourhood power grid where you can share your energy as a community, costs come down for everyone. Greg was excited by a German start-up, Sonnen's intelligent battery system, which collects energy from solar PV panels and intelligently stores, uses or sells it to the National Grid. The Sonnenbatterie has a community function where owners can share energy with each other and it even offers a blockchain-based record of all energy unit transfers.

One of the biggest changes coming over the next few decades will be in transport. The move to autonomous, electric vehicles and away from everyone owning their own car will revolutionise our roads and potentially our home and work lives. Technology has already led to an increase in remote working from home. However, many people still have a deep need to spend time with their colleagues in person, at least some of the time. Remote working makes sense for employers too, reducing the amount of costly office space needed. There will always be plenty of hands-on jobs that can't be done from home, such as caring, manufacturing and hospitality roles, for example. Even with autonomous vehicles on the roads, transport hubs will remain important and investing in property close to these hubs will still make sense.

In a future where few people own their own car, drives and garages will not be needed. Developers and landlords will need to think about pick-up zones, where residents or tenants can be picked up and dropped off by autonomous vehicles. In the US, property developers in urban areas are already encouraging apartment buyers to give up their cars by offering membership of car and bike sharing schemes or Uber vouchers as part of their apartment purchase, thus minimising the developer's outlay on parking provision. Greg Lindsay sees a future where every building comes with a free autonomous shuttle for residents. One of the most interesting terms used when

talking about increasing urbanisation is “densification”. This means creating denser population centres, rather than sprawling cities. How can we “densify” cities? Growing vertically rather than horizontally is one way and making better use of space is another. If we can get rid of parking spaces in buildings and car parks, that frees up substantial space for densifying cities.

SMART CITIES



We can't mention the big picture without mentioning Smart Cities. What is a Smart City? The British Standards Institute (BSI) defines the term as "the effective integration of physical, digital and human systems in the built environment to deliver a sustainable, prosperous and inclusive future for its citizens".¹⁰⁰ Much like a Smart Home, Smart Cities are part of the Internet of Things, in this case using internet-connected sensors to help cities to use resources more efficiently.

With increasing urbanisation being one of the global megatrends affecting our world, creating Smart Cities will help to make our larger cities safer, more efficient and sustainable.¹⁰¹

Transport

As mentioned previously, driverless/autonomous electric vehicles could make car ownership a thing of the past and change the face of public transport into a multi-modal network – some say make it obsolete, although this is unlikely, as congestion would still be an issue in that case. The ‘last mile’, after you get off public transport has always been the problem, but bike sharing schemes and a focus on making residential areas more ‘walkable’ will help there.

Even now, the city of Barcelona in Spain¹⁰² is using sensors to help people find a parking space, combating the wasted time and energy spent, plus congestion created by searching for parking spaces – 4 days a year for the average UK motorist!¹⁰³ Smart traffic signals create better traffic flow and can prioritise buses or multi-person transport over single occupant cars. More information is creating better public transport, whether that be the fastest route to your destination or which carriage of the train to board, where there are more seats.

Energy and waste management

Smart energy grids can monitor usage and ensure that energy is being used efficiently. Batteries can store and more efficiently distribute renewable energy. Intelligent street lighting is only used where there are people, saving energy, and can also tell the council when a bulb needs replacing.¹⁰⁴ Connecting to the Internet of Things will ensure that we can make better use of resources and work more efficiently. A good example is smart bins, which tell the council when they need emptying, enabling the binmen to concentrate on emptying bins as needed. When I spoke to Greg Lindsay of the New Cities Foundation, he felt that some of the technology we will see soonest in our cities will be smart bins, smart post boxes and delivery robots or drones that bring your shopping to you. This could happen even before autonomous passenger vehicles become mainstream.

Recently, Scotland's seven cities announced a joint initiative to implement Smart City technology, which they believe will create a more desirable and sustainable place to live and work, plus encourage investment through innovation hubs and open data distribution.¹⁰⁵ Smart Cities are coming, here and abroad, with the aim of minimising the downsides to city living and making urban life easier, more enjoyable and sustainable. For property investors, it would seem like a good idea to find out which cities are moving towards Smart City status sooner, which should make them more desirable places to live and work.

Conclusion

Megatrends drive the future of property and PropTech. The shift to urbanisation, population growth, new mobility, energy efficiency, escalating health needs and technological advancement all feature as having an influence on our future property and housing needs.

Smart Homes and Smart Cities need to be more than just tech toys. My interviewee Greg Lindsay stressed that smart homes need to be more than an Alexa-enabled facility to be truly useful, such as being a part of micro-power hubs and connected to sustainable transport hubs. He also talked about the dark side of smart homes, such as the threat of hacking and data theft, which we need to keep an eye on.

Community living will make a comeback. The need to live more closely together and care for the elderly could give rise to greater community-based housing, be that through co-living buildings, inter-generational homes or more user-friendly homes for the elderly in the future.

Technology can help us to connect better in a 'real-time, real-place way'. We have a surveillance society not a connected society right now. So, imagine how the technology behind apps like Tinder or Four Square could help to deliver relevant information about the

people around us to help enable a sense of community living and camaraderie.

Housing delivered as a branded, on-demand, consumer-oriented service offering will increase. Throughout this book, many of the experts I interviewed have talked about the consumer demanding greater services delivered via different economic, sharing or crowd-based models. Hospitality delivered by clever brands using new platforms sounds quite different to a landlord renting to a tenant they found on Gumtree doesn't it?

The economics of real estate will also change – unaffordability, welfare funding and the demand for pay-as-you-use services will give rise to new models of funding and payment of property usage. Crowdfunding, Block-chain, big business or philanthropic-backed micro-communities and the 'charge by the unit' approaches offered by Airbnb and WeWork are all examples of this emerging trend, starting within the commercial sector. In short, we might expect to see homes or properties become more of a 'membership asset model'.

Some large players are now selling off suburban portfolios and instead focusing on the dense urban areas as 'that's where the money is'. I always like to say "follow the money", and it looks like finding ways to densify cities seems to be where the money is headed. If some of the topics discussed in this chapter sound a bit fluffy, don't be deceived. If the big developers, venture capitalists and asset managers are moving in this direction, you can bet that the rest of us will be too, whether we like it or not.

[90](#) ONS report on England's aging population

[91](#) Chronic shortage of suitable housing for the elderly

[92](#) Poor housing costs NHS £500m a year

[93](#) UN World Urbanisation Prospects 2018

[94](#) PWC report into implications of megatrends

[95](#) Best cities for rental yield UK

- 96 Growing demand for food, energy and water
- 97 Conflicts and partnerships arise from resource scarcity
- 98 Smart Cities definition
- 99 Can Smart Cities mitigate increased urbanisation issues?
- 100 Barcelona: The most wired city in the world
- 101 UK motorists spend four days a year looking for parking
- 102 Smart Cities enhance efficiency
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- 104 Smart Cities enhance efficiency
- 105 Scottish cities embrace Smart Cities technology

CONCLUDING THOUGHTS & NEXT STEPS

“Any sufficiently advanced technology is indistinguishable from magic.” Arthur C. Clarke.

Or, as Leigh Brackett put it decades earlier,

“ Witchcraft to the ignorant ... simple science to the learned.”

Is PropTech witchcraft or magic, or is it merely science and technology advancing? I imagine there could be arguments on both sides. I recall interviewing Andrew Baum from Said Business School and Oxford University at the start of the PropTech podcast series, where he jokingly referred to being afraid of being attacked by his dishwasher in the middle of the night, presumably at the instigation of a rogue hacker accessing it via its Internet of Things connection. Of course, we also have The Terminator theory, where the machines rise up to take over the World, but through real life advances in artificial intelligence.

Putting natural human fear and sci-fi films to one side, nobody knows just how a computer using AI managed to so accurately predict which hospital patients would go on to develop schizophrenia, which is a bit of a concern... the right answer yes, but what was the thought process in order for humans to learn from and validate its conclusions? Then, we have the driverless cars from Tesla and Google that have caused accidents, the CryptoLocker virus that brought several large and small corporations and networks to their knees. Add to this exploding e-cigarettes, lightning-attracting iPods, a cliff-diving Segway and the occasional image of a satnav guided

lorry stranded half-way up a mountain footpath and it's perhaps easy to think that there is indeed a bit of witchcraft afoot at times!

These examples are two sides of the same coin though really. Progress takes us into the unknown and the seemingly impossible at times. However, as we venture into new territory, sometimes we go too quickly and make mistakes, which require us to take corrective action.

I am quite optimistic about technological advances in the most part, and about PropTech in particular, as you may have detected. I believe our lives will ultimately get easier and not harder and as property investors, developers and landlords, we will increasingly have tools, systems, apps and other technology advances that will improve our productivity, increase our profitability and help with both our property or asset management and our customer service too.

In my opening, I recalled how the book, *The Second Machine Age*, described information technology as the new industrial revolution. Two main trends are driving this:

Geometric or exponential technological development resulting from the theory of 'the second half of the chess board'. From a start in the 1960s, technological development only reached half-way across the chess board in around 2013. This, combined with Moore's Law, where the cost of production of technology is halving every 18 months, means...we ain't seen nothing yet in terms of the speed and scale of technological development!

Let's remind ourselves of the key points that cropped up throughout the book:

1. **ConTech or Construction Technology.** The ConTech scene is characterised by alternative building methods, such as pre-fab or off-site build, 3D printing and robotic aids. Equally, new building materials are starting to be developed, but have a way to go before becoming fully mainstream, so perhaps it's a progression of existing

materials, such as self-healing concrete, rather than a giant leap to graphene...for now at least. Expect to hear more about Build-to-Rent, Self-Build, energy-efficiency and the use of more sustainable methods, such as Passiv Haus.

2. Smart Homes & the Internet of Things. The key takeaway for me is that Home Automation, Access Control & Property Monitoring technology is not only improving but connecting, converging and becoming increasingly more convenient all the time. Big solutions will be addressed through property management and security apps, energy and building management systems and the Internet of Things will make it all joined up and pretty useful too.

3. Big Data, AI, Systems, Tools and Apps. The development of big data, AI and social media is also helping to shape new ways both to engage with our stakeholders as property investors and to track our property assets. Be it hybrid or DIY agencies such as upad or Homerenter, property management tools like Arthur or an intelligent robot such as Ask Porter, we can utilise new tech right now. And what is driving these apps? Big data, AI, the Internet, especially the mobile Internet, and social everything, that's what. We also shared some of our top apps – don't forget to drop check our resources page if you want access to these: our top apps list at the last count spanned 8-pages and covered over 30 separate categories, including; Property Management, Mapping, Valuations, Works Costing, Viewing Services, Alternative to Tenant Deposits, Interior Design, Electronic Signatures and Banking to name just some.

4. Audio-visual Advances including augmented reality / virtual reality (AR / VR) and drones. Virtual Reality is not new, but it is more mainstream with cheaper hardware and a more defined business case now. It's all in the mind...and the heart – Dawn Lyle, a podcast guest, illustrated so well how virtual reality can trick our subconscious mind into believing we are immersed in this unreal world. AR & VR can help with a number of applications – planning

and design, inspections and viewings, marketing and sales, and when we add in drones, maintenance and testing too.

5. The Sharing Economy. We covered a lot of ground here, but I guess in conclusion, the Sharing Economy is also evolving in itself. It is not just peer-to-peer now, as digital disruption is coming everywhere. Peer-to-peer, micro-service providers, or 'disintermediated marketplaces' all add to the expansion of the digital economy generally. As I said previously, the boundaries are blurring and will continue to do so. This means, the future is unpredictable and likely to change quite a bit too!

6. FinTech or Financial Technology. The rise of the Internet over the past 18 years and the Mobile Internet, in particular over the past 5 years, is allowing more financial services offerings to be made available to more people, more efficiently. This means reaching more customers faster, cheaper, whilst always available and without physical or geographical limits. People just expect digital service delivery now. People and machines are working together – machines can simplify processes, leaving well-trained and experienced people to focus on what they are good at doing.

7. Blockchain & Cryptocurrencies. Where could Blockchain technology be used?

- Payments, especially micro and cross-border
- Property Exchange or auctions
- Property trading and fund-raising – for example, look at a company called Dominion with Mark Lloyd, a former guest on The Property Voice Podcast
- Rental listing & management
- Land registry
- Others potentially ripe for deployment of Blockchain tech: insurance, legal, finance, regulation, compliance and data verification.

Imagine for a minute the Blockchain combined with AI and The Internet of Things...that could be powerful couldn't it?

8. EdTech or Education, Learning and Development. Property training has been a fast-growing segment within the fast-growing EdTech sector too. There are lots of learning resources available, including many that genuinely fall within the EdTech definition. Self-directed learning is growing and spreading across new media at the same time. Don't forget about the Learning Styles and Forms of Intelligence to ensure that you select the right learning resources that match your 'smarts' and the way you like to consume information. The 4S Model – Self-Study, Structured Learning, Shadowing or Sink or Swim should help you to establish the right approach or mix of approaches that suites you best. In other words, you can look at PropTech to help you to learn, but you can also choose to learn about PropTech in a way that suits your style too.

9. The Big Picture...Smart Cities, Globalisation and Megatrends shaping the future. Greg Lindsay helped me to see the bigger picture when we spoke. For example, how some of the Megatrends will direct us – especially urbanisation, energy shortages and mobility changes. Smart Cities growth and development – for example fewer cars and more shared transport hubs, more dense living, local energy hubs and so on.

Greg's predictions for the future as it relates to PropTech...

- Community Living making a come-back.
- Housing as a service and as a brand, not simply an asset.

Some further PropTech predictions...

Andrew Baum also suggested when we spoke that those with the deepest pockets are likely to make the biggest splash, that change in property is hampered by the slower and lower transaction volumes and so many short-term changes will come from related sectors such as valuations, lettings and finance.

Andrew also saw some longer-term game-changers potentially through big data and AI, and the emergence of the 'crossover'...no, not a new mountain bike, car or even a bra, but instead the likes of Google and Amazon stepping into device manufacture and Rightmove selling houses direct! Dan Hughes, another of my podcast guests, built on this theme when he mentioned L&G, the insurance company and Facebook the social network, building homes in one way or another. Andrew had a couple of thoughts on Blockchain rollout being a potential game-changer and Smart Home devices helping with the energy agenda too.

Dan Hughes also encouraged us to think that technology is not be feared and can help us. Greater connectivity...between humans and devices, as well as advances in building design and manufacture are likely to lead the way.

Dominic Wilson, from the venture fund Pi Labs, said PropTech can help to make one of the more traditional and slower changing industries improve productivity and efficiency. But, it's probably evolution, not revolution...a phrase we heard a lot throughout the podcast series and this book.

Dominic then gave us some pointers to look for going forward...

- Some sectors to watch over the coming years: ConTech (construction technology), InsureTech (insurance technology) and more focussed: care homes or assisted living.
- Some tech to watch over the coming years: Artificial Intelligence (AI) & Blockchain.
- His longer-term thoughts: the growth of the sharing economy, fractional ownership of property assets & rising trend of consumers as customers.

Finally, here are some of my own big tips and predictions...mostly stolen from bigger brains than mine along the way, or picked up

through the vast amount of reading and research I have done on the PropTech subject throughout the last year...

- Big data will only get bigger, if 90% of all the data created was done so over the past 2 years, then how much in the next 2 years?
- AI and machines are coming to a business near you...soon! Robots and machines will compliment humans to improve efficiency but can also be taught to replace us in some cases too.
- The Internet of Things will create a step-change in the speed of data transfer and connectivity of devices, making everything talk to everything else and so improving our lives and speed up our learning.
- Blockchain could well be the next Internet...even if not Cryptocurrency, the decentralised database will just take off.
- New building materials, methods and design will bring innovation and productivity gains to construction...just recently, I invested in a start-up company that makes translucent solar panels that can replace all the glass in a building, turning it into an energy source and then I heard about a family in France moved into a 3D printed house.
- Fractional and other ownership models, along with a shift towards 'property as a service' to and treating occupants as a customer, will create new models of property utilisation, where home-meets-work-meets-play, among other variants.
- If you do want a glimpse into the future of PropTech, then I would highly recommend getting involved with some of the equity crowdfunding sites that are out there. If nothing else, it's just fascinating to see what ideas people are coming up with, so sign up and just be a voyeur if you like...you don't have to fritter away your money in everything you see out there...but maybe you will happen across the next big thing, who knows?

There are some common themes in there aren't there?

Wrap-up and Next Steps

The podcast series and book writing has genuinely opened my eyes to the emergence of PropTech and how it has already started to impact our lives and will continue to do so. I am a property investor first and foremost, not a 'property technologist', so I hope you, like me, have enjoyed understanding and learning the topic of PropTech over the course of this book.

One thing is for sure, progress stops for no man (or woman), including the author! As such, as further developments in PropTech unfold, this book will naturally become superseded over time. Even as I write this conclusion after around three months of starting the book, things have changed in the world of PropTech, and I was tempted to hold off publishing it to add in those extra bits and pieces to make it 'bleeding edge' up to date. However, the reality is that this would be a never-ending quest, akin to painting the Forth Road Bridge! So, I shall leave it as is with an autumn 2018 timestamp with the principles and picture of PropTech as I see it right now for you to reference against then! However, what I do plan to do is to maintain a list of Top Prop-Tech Apps & Resources as and when these are released and updated. I would therefore encourage you to visit the Book Bonus Page and sign up to receive updates to this list. In addition, you will find one or two other goodies from me, other contributors to the book and podcast, and maybe also from the odd generous soul from the wider PropTech community too! In addition, there will be a PDF version of the book and the associated links available there, which will be updated from time to time.

To receive the free PropTech Book Bonuses, just visit the following sign-up page:

<http://www.thepropertyvoice.net/proptech-bookbonus-sign-up/>

Password: **PropTech Book**

Heartfelt thanks must go to the many people that helped make this book possible. I started as a curious bystander, yet so many of you

have shared your time, knowledge, networks and insights to help me, and more importantly you dear reader, to understand more about the topic of PropTech, which will no doubt become a great influence on how we live, work and use property in the future.

I would like to encourage you to learn more about, and more importantly to apply PropTech into your own property world; be that as a landlord/investor/ developer like me, someone operating in the wider world of PropTech, or simply as a homeowner/occupier looking to improve the way you live and use property. Don't forget to sign up for the book bonuses and feel free to get in touch if you would like to; you can reach me via the email admin@thepropertyvoice.net or via my website: www.thepropertyvoice.net

FINAL THOUGHT

“Technology is cool, but you’ve got to use it as opposed to letting it use you.” Prince

APPENDIX

PropTech Book Full Links

Introduction

1. 90% of data created in last 2 years

<https://www.ibm.com/blogs/insights-on-business/consumer-products/2-5-quintillion-bytes-of-data-created-every-day-how-does-cpg-retail-manage-it/>

2. The second half of the chessboard

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Chapter One - Construction Technology

1. No. of new homes built in UK

<http://www.bbc.co.uk/news/business-42055623>

2. Investment in modular construction

<https://www.mortgageintroducer.com/firms-investing-modular-housing/>

3. Budget boost for modular construction

<http://www.telegraph.co.uk/business/2017/11/26/lg-accelerates-housebuilding-large-sites-budget-boost>

4. Berkeley Homes build modular homes factory-twvk

5. RIBA study finds new homes not desirable

<http://www.brand-newhomes.co.uk/RIBA-Case-for-space-2011.pdf>

6. Hadrian X robot bricklayer

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7. Highgate “3D-printed” house

<https://www.ft.com/content/99bd10aa-519c-11e5-b029-b9d50a74fd14>

8. Apis Cor 3D-printed house

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<http://www.hse.gov.uk/statistics/industry/construction/construction.pdf>

10. 3D Construction and Insurance

<https://www.iamagazine.com/strategies/read/2017/08/23/how-will-3d-printing-impact-in-surance>

11. 3D printing for building components

<https://www.theguardian.com/sustainable-business/2017/jan/31/building-by-numbers-how-3d-printing-is-shaking-up-the-construction-industry>

12. Modcell modular straw bale panels

<https://www.constructionnews.co.uk/companies/supply-chain/beyond-the-bale-modcellsmashes-stereotypes-with-straw->

[solutions/8679323.article](#)

13. Mortgage lending on timber framed homes

<https://www.merronbrook.co.uk/faqs>

14. Nanotechnology destroys assumptions

http://www.ecobuildingpulse.com/products/five-innovative-building-materials-shaping-the-future-of-architecture_s

15. ICF panels offer superior insulation

<http://www.logix.uk.com/beat-the-beast-from-the-east>

16. Home Building Fund boosts developers

<https://www.gov.uk/government/publications/home-building-fund/an-introduction-to-thehome-building-fund>

17. How Build To Rent is changing London property narrative

<http://www.ldevents.net/news/how-build-rent-changing-london-property-narrative/>

18. Government guidance for self-builders

<https://www.gov.uk/guidance/self-build-and-custom-housebuilding>

19. The Collective's services at The Old Oak

<https://www.thecollective.co.uk/coliving/old-oak>

20. Minimum Energy Efficiency Standards

<https://www.rla.org.uk/landlord/guides/minimum-energy-efficiency-standards.shtml>

21. Meeting Energy Efficiency Standards a reasonable cost

<https://www.businessgreen.com/bg/news/3015003/new-rules-could-let-landlords-off-thehook-for-energy-efficiency-improvements>

22. About the RHI

<https://www.ofgem.gov.uk/environmental-programmes/domestic-rhi/about-domestic-rhi>

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1. Nest- average savings

<https://nest.com/uk/support/article/eu-savings>

2. Landlord thermostat average savings

<https://www.inspirehomeautomation.co.uk/landlords.php>

3. Is Amazon making a fridge?

<https://thespoon.tech/is-amazon-considering-making-a-smart-fridge-probably-not-butmaybe/>

Chapter Three - Artificial Intelligence

1. Number of global internet users

https://thenextweb.com/contributors/2017/04/11/current-global-state-internet/#.tnw_iUh-kTTm1

2. Property data use lags behind other sectors

<https://realyse.com/blog/post/future-property-data-efficiency>

3. Settled cuts cost of legal services

<https://www.settled.co.uk>

4. Gazumping - the act of a seller accepting an offer from one buyer, then opting for a higher offer from another buyer. Gazundering - when a buyer reduces their offer amount after the initial one has been accepted. Gazanging

- the act of a seller pulling out after an offer has been accepted, usually due to a simple 'change of heart'.

No link

5. Settled's anti-gazumping feature claims initial 100% success rate

<https://www.settled.co.uk/blog/product-update-strengthen-secure>

6. Rightmove data services

<https://www.rightmove.co.uk/data>

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<http://www.bbc.co.uk/news/technology-30290540>

8. Hawking's view is more balanced than media suggests

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11. DoNotPay's free legal bots

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12. Dom - Domino Pizza's ordering bot

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13. Tay - when chatbots go rogue!

<https://www.theguardian.com/technology/2016/mar/30/microsoft-racist-sexist-chat-bot-twitter-drugs>

14. Chatbot offers instant free valuations

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15. How chatbots will improve the property industry

<http://realestatetechnews.com/blog/how-chatbots-will-improve-the-real-estate-industry>

16. How machine learning will affect real estate

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17. AI bringing in human quotas for employment?

[-ments-introduce-human-quotas-study-says](#)

Chapter Four - AV Advances

1. History of Virtual Reality

https://en.wikipedia.org/wiki/Virtual_reality

2. Increasing usage of VR by big business

-ness-2017-12332674

3. Realism of VR before a brick has been laid

<https://icreate.co.uk/virtual-reality-augmented-reality-property-marketing-can-be-lieve-hype/>

4. Student viewings now possible via VR

<https://www.vrfocus.com/2017/10/students-can-now-view-property-in-vr-with-university-cribs/>

5. Customising new builds with VR

<https://www.marxentlabs.com/ar-solution/visualcommerce-showroom/>

6. How drones are revolutionising TV production

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8. Benefit of drones for the environment.

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9. Benefits of drones for property marketing

<http://droneblog.com/2017/04/17/flying-high-guide-to-using-drones-to-market-your-real-estate-property/>

10. Dangers and legislation relating to UAVs

<https://www.caa.co.uk/Commercial-industry/Aircraft/Unmanned-aircraft/Small-drones/Regulations-relating-to-the-commercial-use-of-small-drones/>

11. Drones in emergency construction

<http://www.bath.ac.uk/research/news/2016/02/17/robotic-drones-to-%E2%80%98print%E2%80%99-emergency-shelters-for-those-in-need/>

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Chapter Five - Sharing Economy

1. ONS finding ways to measure Sharing Economy UK output

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2. Profileration of relevant techs behind Sharing Economy

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3. Sharing Economy definition from Sajid Javid MP

<http://www.sharingeconomyuk.com/publications>

4. Millennial generation shift away from ownership

<https://www.pwc.com/us/en/technology/publications/assets/pwc-consumer-intelligence-series-the-sharing-economy.pdf>

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'Technology will change real estate and however you react to it, you must understand what is going on. This book will help you to do just that.'

**Dan Hughes, CEO Liquid REI
(formerly of RICS).**

#PropTech: a guide to how property technology is changing how we live, work and invest, is the second title to be published by Richard W J Brown, a.k.a. The Property Voice, following the successful publication of Property Investor Toolkit a few years ago.

#PropTech was initially inspired from personal curiosity after Richard started to observe an emerging and growing trend in his industry. The advent of new technologies in other industry sectors, such as e-commerce, financial services, application development and mobile communications started to crossover into the real estate property sector.

The real estate property sector is often seen as slow-moving; however, some clear influences are starting to bring about change at a more rapid pace now more than ever. There is a push and pull effect. The push comes from the need for more housing, skills shortages and limited resources generally. The pull comes from homeowners, tenants, developers and investors who want to be more productive, profitable and transfer their experiences elsewhere into their property interests.

#PropTech is written by a property investor, homeowner and occasional Airbnb guest with a broad audience in mind. If you are involved with or have an interest in the real estate property sector, either personally as a landlord, homeowner or industry professionally, then this book will have something in it for you!

Here are the main chapter headings from within the book:

- Construction Technology (ConTech)
- Smart Homes & The Internet of Things
- Artificial Intelligence, Big Data, Tools and Apps
- Audio-visual Advances
- The Sharing Economy
- Financial Technology (FinTech)
- Cryptocurrency and The Blockchain
- Education Technology (EdTech)
- The Big Picture Smart Cities, & Megatrends

Pause for a moment and consider that in 2018, when this book was written Rightmove, will have its 18th Birthday, the iPhone is only 10 years old, Airbnb is just 9 years old and Purplebricks is still pre-school at 4 years old. To help put this into context, now we have the likes of Facebook and Google building homes and communities, robot bricklayers and 3D printers that can cut housebuilding from months to just days, 20 million Alexa devices sold allowing people to literally speak commands to their homes, all under the backdrop of a massive growth in Big Data, with 90% of all the world's data ever created coming in the past two years alone!

Breakthrough technologies, such as the Internet of Things, Blockchain and Artificial Intelligence are already starting to generate useful applications and will continue to do so. PropTech, is a huge subject area that is going to change property investment, development and indeed our wider lives in myriad ways. There will certainly be some bumps along the way but, PropTech has the potential to create huge opportunity for homeowners, investors and developers alike. However, as with the Internet revolution, there will be winners and losers, and often the first one through the door is the one that gets shot!

So, please join me, along with the insights of no less than seventeen PropTech founders, academics, influencers and all-round-know-their-stuff 'subject matter experts', as we lift the lid on what is sure to be a significant area of growth and change for real estate property in the not so distant future.

For sure, one thing is for certain...change is coming, whether we like it or not! So, it is probably better to at least be aware of the changes that PropTech is likely to bring, then at least we can prepare, profit or protect as appropriate.

You can see more about Richard's work and industry contribution as The Property Voice at www.thepropertyvoice.net.